

Issue 071 July 2011

**Jacques Pena, Peter Zoppi,
Igor Kudryavtsev & more!**

Gallery - 10 of the best images
from around the world!

Simon Fuchs

3dcreative interview this fantastic
3D Environment artist

"Ronaldo Fenomeno"

Project Overview by Bruno Hamzagic

CLASSICAL SCULPTURE

RAFAEL GHENCEV BRINGS US THE FINAL CHAPTER OF HIS ZBRUSH SERIES

NEW!!! Cartoon Animals

This issue **Marcos Nicacio** kick starts our new **Cartoon Animals** tutorial series by creating a cartoon mosquito.

Low Poly Characters

Texturing is the subject matter this month for **Tamara Bakhlycheva** as she brings us chapter 3 of her **Low Poly Characters** tutorial series.

Modeling Features of the Human Anatomy

Jose Lazaro, Gavin Goulden, Lino Masciulli & Anto Juricic continue our **Human Anatomy** tutorial series by showing us how to create hands.





EDITORIAL

This week the 3DTotals team (well the boys anyway) went to watch the latest Transformers movie in 3D (if you like the other two you will like this one, that is the quickest movie review in history).

Once again we were wowed by the epic scenes and jaw dropping robot animation and are well prepared for the influx of robot

models which will no doubt be submitted to the 3DTotals galleries shortly. If you have aspirations to work in this sort of field you need look no further for your training than 3DCreative magazine.

We will kick off this month by looking at our interview. A few of the guys in the 3DTotals office have been telling me for a while now how amazing the environments are in the recent Xbox game Crysis 2. I thought I would look into this a little and stumbled across an outstanding environment artist by the name of [Simon Fuchs](#). Simon is a great guy to interview and has given us amazing insider information as to the approach he uses to create environments like the outstanding ones you will see with this interview. I know that you are going to love this one.

Next we will move on to this month's making of because it seems that [Bruno Hamzagic](#) and I share a similar passion, football. I can tell that Ronaldo had the same impact on Bruno as he did on me, back in the days when he had that silly haircut and found it almost impossible to not score goals. Recently Ronaldo retired from professional football and as a tribute to him Bruno created this very cool and funny caricature and in this issue he shows us how he made it.

This month's cover image is the outstanding work of [Rafael Ghencev](#) who in this issue wraps up our classic sculpture series by showing us how he textured his outstanding Roman bust. Next month we step onto new ground for 3DCreative and start a new series on Vue with [Alex Popescu](#).

Last month we finished our Unreal Games Engine tutorial, so this month we can proudly introduce our new series about designing and modelling Cartoon Animals. In this series our artists will be showing us how to create cool and unique cartoon characters kicking things off with [Marcos Nicacio](#) who shows us how to create a cartoon Mosquito.

[Tamara Bakhlycheva](#) continues her fantastic series about creating low poly characters by showing us how to unwrap and texture

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your model. In the next issue she will be showing us how to complete our model and how to present it to the CG community.

Our modelling features tutorial series has been great so far and this latest instalment could prove to be a real handful. The usual crew are back again with [Lino Masciulli](#) in Cinema 4D, [Jose Lazaro](#) in 3ds Max, [Gavin Goulden](#) in Maya and [Anto Juricic](#) in Modo.

Wow! There is a lot of great content in this issue including our stunning gallery featuring work by [Peter Zoppi](#), [Victor Hugo](#) and many more amazing artists.

3dcreative

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Cover image by Rafael Ghencev

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1. Open the magazine in Reader;
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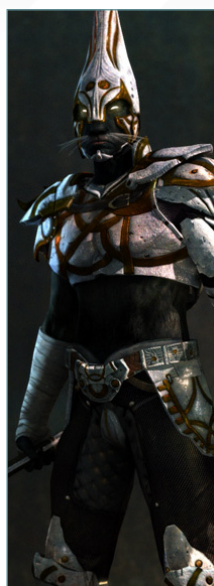
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CONTRIBUTING ARTISTS

Every month artists from around the world contribute to 3DCreative, and you can find out a little more about them right here! If you'd like to get involved in 3DCreative magazine, please contact: simon@3dtotal.com



JOSE LAZARO

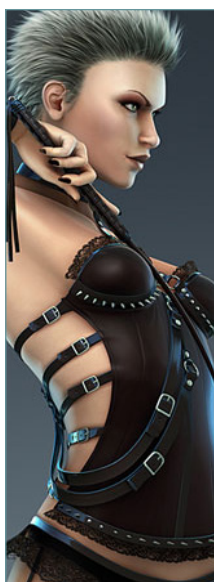
Jose Lazaro is a freelance character artist based in the UK. After working in big titles like CastleVania: Lords of Shadow and Dead to Rights he has decided to change his career creating characters for indie games with more artistic and technical control, developing the pipeline and the final result. Currently he is a mentor for one of the best CG schools.
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GAVIN GOULDEN

Gavin Goulden is a character artist for Irrational Games working on Bioshock Infinite. With 6 years games industry experience, he has contributed character and environment art assets to multiple titles including Dead Rising 2, The Bigs 2, Damnation and FEAR 2.

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LINO MASCIULLI

Lino Masciulli worked as an art director in the advertising field until 2006. In recent years he moved into the entertainment industry by working as the senior modeler for Rainbow CGI in Rome participating in the production of "Winx and the Secret of the Lost Kingdom", "Winx Club 3D Magic Adventure" and other movies. He currently works for the same company on other animated feature films.
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ANTO JURICIC

Anto Juricic Toni is a character artist and he currently lives in Bosnia and Herzegovina, where he works at Primetime Studio as a modeler and texture artist on animated features. Along with his passion for creating CG characters he also enjoys teaching others and sharing his techniques through many online tutorials and publications.

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SIMON FUCHS

Simon Fuchs is a 28 years old who has been working in the games industry for about seven years. He specializes in environment asset creation and is currently employed as a Senior Environment Artist at Crytek. He has worked on several different games, from Kids Games to AAA titles and has just finished working on Crysis 2.
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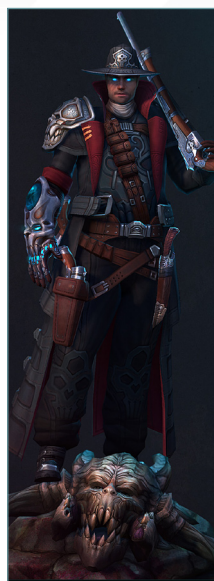
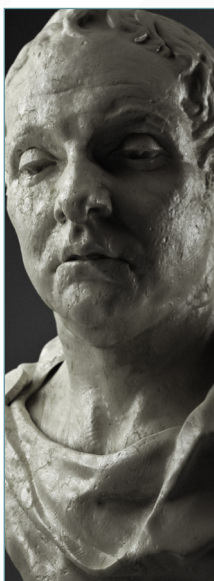




RAFAEL GHENCEV

Rafael Ghencev is Brazilian character artist. He studied film animation, but it is in traditional art that he considers to be the greatest secret of art. Because of this he is always studying sculpture, painting and photography.

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TAMARA BAKHLYCHEVA

Tamara Bakhlycheva was born in Russia. She graduated traditional art-school and art-college and now resides in Moscow, working as freelancer 3d character-artist and dreaming about working for Blizzard. Tamara loves to play video games and has done since the age of 5. Tamara has been making art for video games since 2005.

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BRUNO HAMZAGIC

Bruno Hamzagic is an artist who likes to illustrate and animate in 3D and 2D. He is always studying and experimenting with different ways to create original shapes and designs. He started his career as an amateur graffiti artist and doing caricatures and panel painting. Later in his life he came across digital art.

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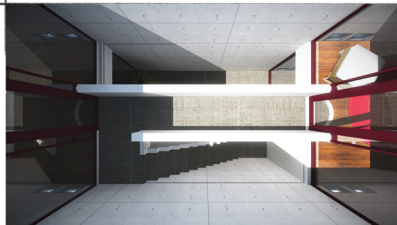
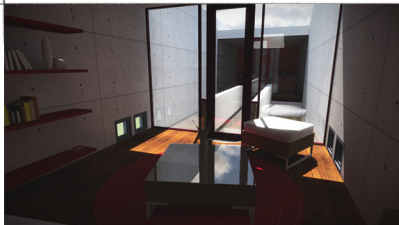


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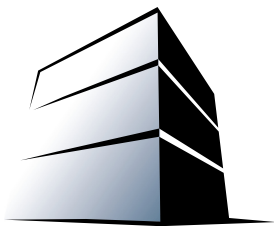
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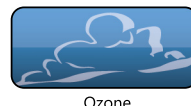


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SIMON FUCHS

Simon Fuchs is a 3D environment artist who has recently worked on the acclaimed *Crysis 2* game. As well as modelling and texturing some of the stunning sets within the game he has also contributed towards *Crysis Wars* and a number of other successful titles during his career so far.

“UNDERSTANDING PROPORTIONS, ARCHITECTURE AND COLOR THEORY ARE JUST AS IMPORTANT AS THE TECHNICAL ASPECTS LIKE THE MODULARITY OR PERFORMANCE OF YOUR SCENE”



You have worked on a number of titles since you starting working in the games industry, but what do you feel have been the main changes and improvements over the years to PC titles from a developer's perspective?

PC hardware and game engines are constantly evolving. From a developer's point of view this gives you lots more possibilities and options, but it also increases the scope of your project. There are certain features customers expect from a full price game today that were not achievable five years ago due to technical constraints.

Normal maps on every asset, dynamic lighting, breakability, large scale multiplayer and a more or less open world are standard for shooter games these days. Six years ago a developer would focus on one of these areas whereas today you will need to implement all of them to be able to compete with the other products on the market.

While these features certainly make your game a lot more interesting they will also vastly increase the time and money it takes to build it. For a game like *The Guild 2* we needed about

four artists to create the entire environment whereas today you would need around ten to twelve people just to build the environment assets themselves.

More powerful hardware and newer engines like CryEngine3 make working on current games a lot more fun and interactive. Being able to move objects around or to adjust the lighting in real-time and then to jump in-game with the click of a button without having to wait for the level to compile is just great, and allows for much faster iterations on your game.







CRYSIS 2

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You have mentioned areas in which games have evolved over recent years, but how do you anticipate they will change over the next six years or so?

The new DX11 graphic cards are becoming more readily available and the new console generation is not too far away either, so the next big feature we can look forward to that actually impacts content creation is real-time displacement mapping.

At Crytek we are currently working on a DX11 patch for *Crysis 2* which will add this feature to the PC version. It's really stunning to see the geometry that you sculpted displayed with millions of triangles in real-time. This is going to be a big step up in visual quality and can be used to generate some truly stunning environments.

I'm also hoping to see new features regarding breakability. It's very time-consuming to create destroyable assets and I'm hoping for a procedural solution to make the life of artists a bit easier. The PhysX technology that Nvidia is working on looks very promising and could be a big help when it comes to adding breakability to your game.

In the long run games will reach a level of visual quality where they will hardly be distinguishable from movies. Thus they will have to stand out based on their features and not by the quality of their visuals. Things like artificial intelligence, storytelling, creative gameplay or style will become even more important and I hope to see major improvements in all of these areas.

***Crysis 2* has been very well received by both the media and the public alike. When given an environment to build what are the typical approaches you take and what constraints affect the way you go about organizing the model components and texture templates?**

We usually start out with a whitebox model of the environment that contains all features relevant for gameplay in this area. Things like cover height, door sizes, scope of the area and different paths to access it are defined.



“IT'S VERY TIME-CONSUMING TO CREATE DESTROYABLE ASSETS AND I'M HOPING FOR A PROCEDURAL SOLUTION TO MAKE THE LIFE OF ARTISTS A BIT EASIER”

After that the scene gets passed on to the concept art department which creates a concept painting based on the whitebox and the vision of the art director. They will define the mood of the scene and the main features. Depending on the object this can be a quick over-paint of the whitebox or a fully realized concept of the entire area with shots and paintings from different angles.

We then export the whitebox geometry from CryEngine to 3ds Max and start building the asset based on the existing block-out. Depending on the size of the scene and the time available to build it I usually start out with splitting the model into modular pieces with tiling textures so that I can create the asset as fast and efficiently as possible.





The amount of different modules and textures used for an environment are defined by the scope of the area. Indoor areas can usually be a lot more detailed than outdoor areas because there are fewer objects and a lower view distance.

We try to re-use as many textures and models as possible in a scene so that we can keep a smooth frame rate on all platforms. CryEngine has many different profiling tools that show the areas where your environment is over budget. It all comes down to keeping a healthy balance



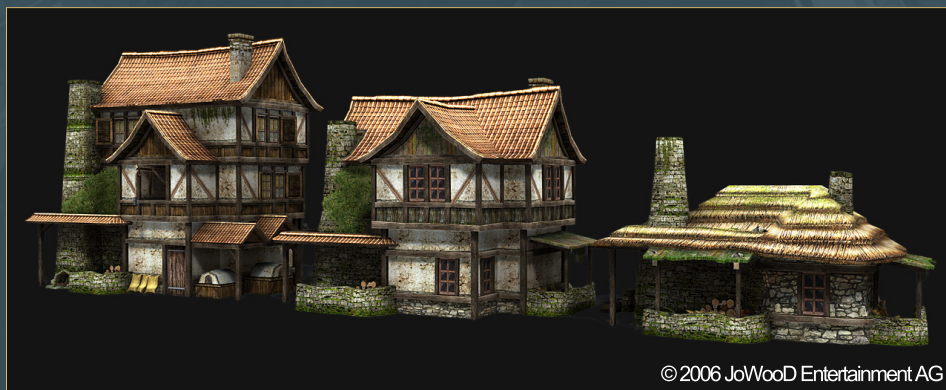
between the amount of characters, lights, objects, physics and view distance in a scene. If you want a really high res asset you will have to tone down the amount of characters or unique objects and vice versa.



When you say you start out with a whitebox model, does that mean that the environments are actually designed in 3D initially and not created by the concept art department and does this mean that artists like yourself have an input?

Yes. We usually start out with a whitebox mesh using primitives in CryEngine and then use these block-outs to create concept art if needed or just build the asset without concept art if it's based on a real-life object and we have enough reference material. Regarding the input, the initial block-outs are usually done by the level designers or game designers themselves in order to make sure the area plays well. After that, every artist can implement his own ideas into the mesh as long as it does not interfere with gameplay and fits with the mood of the scene.





The breakability issues in the game are very impressive. Can you talk us through the process of implementing this and the problems faced with creating interactive scenery?

The breakability process starts in the game design department. They define which assets need to be breakable or bendable. During the production of *Crysis 2* we had a level that contained all non-level specific props like trash bins, benches, air vents and other generic objects that was used to review these assets regarding breakability.

We then went through the individual levels themselves and defined the Action Bubbles in *Crysis 2* that would benefit from breakability on any level specific assets like the Grand Central Terminal asset only existing in one level.

We used this information to create a list of all assets that needed to be breakable and



prioritized these assets based on their usage in the level. Things like cover objects that were used everywhere got a higher priority than assets that were only used once in the game.

“ENVIRONMENT ARTISTS NEED BOTH GREAT ARTISTIC SKILLS AND A DEEP TECHNICAL KNOWLEDGE ABOUT THE ENGINE THEY WORK WITH”

After that the assets were outsourced to the Crytek Kiev studio that had a dedicated group of five artists to only work on breakability. They cut up the meshes and sent them back to Frankfurt where I reviewed them and implemented the technical setup. If everything worked fine the meshes got implemented into the game.

The main problems we ran into were performance problems and missing technical

features in our breakability pipeline. We had to reduce the number of pieces on some breakable assets since performance can drop significantly if all pieces are broken at once – imagine a grenade exploding in front of several pillars that are all breakable.

Other issues were visual glitches in the Level of Detail meshes or gameplay relevant problems. How does the AI recognize when an object is broken; how does cover height get influenced by breakability; how many shots does it take to break a piece; which weapons can break a piece?









We came up with solutions for all of these issues which proved a challenging process, requiring lots of work from all the departments concerned.

What do you feel are the most important aspects to working as an environment artist and what are the most challenging things about the job?

Environment artists need both great artistic skills and a deep technical knowledge about the engine they work with. Understanding proportions, architecture and color theory are just as important as the technical aspects like the modularity or performance of your scene.

Being able to look at a concept painting and capture the essential features of the scene whilst understanding how to build it using the least amount of modules and textures is the most important skill an environment artist needs to learn.

The most challenging part of the job is usually working with the game designers or other departments and implementing their design ideas into your model, especially when it is based on a real-world environment. It can

become quite tricky to implement certain gameplay metrics like cover heights or jump distances into your model without sacrificing visual quality.

In what ways do you avoid tiling issues when texturing large open areas and what are the typical maps you combine during the texturing process?

When creating the texture maps for large tiling surfaces we try to keep localized detail to a minimum in order to ensure the texture will tile well in the game. After that, we have several shaders that we can use in order to break up the tiling.

“WE CREATED A LOT OF CONCEPT ART TO MAKE SURE WE NAILED THE LOOK AND FEEL OF THESE LANDMARKS”

On game meshes we can use a blend shader that allows the blending of two different textures each using their own diffuse, normal and specular maps. The blending is controlled using vertex alpha, a height map and several shader attributes.

We can also use a dirt shader, which allows you to overlay a tiling texture of your choice onto your model. In this case, the normal map stays the same but you can influence the specularity in the areas using the dirt shader. This is controlled via vertex alpha, too.

In addition to that we break up the tiling by using vertex colors on our meshes.

On terrain which is built in CryEngine we can paint several different materials and blend them into each other in real-time.

Level design does a great job of breaking up the tiling by placing additional decals on your model or cleverly distributing props on top of your objects as well.

Regarding the texturing process itself, we usually bake normal and ambient occlusion maps and use these to generate the diffuse and specular maps of our objects. We use a combination of hand-painting using photo overlays and a lot of manipulation of the baked maps. If the mesh resolution is dense enough we sometimes bake ambient occlusion into the vertex colors too.



Do you ever get to design the environments or do you generally rely on concept art for direction?

Since *Crysis 2* plays in New York nearly all of our environments and levels are based on real-world locations. For these we rely a lot on photo reference we took when location scouting and a few bigger concept art pieces that define the general mood of the levels.

For the most iconic and recognizable pieces in the levels, like the City Hall asset in the level "Seat of Power" or the Castle Clinton asset in "Second Chance", we created a lot of concept

art to make sure we nailed the look and feel of these landmarks.

Other areas that are more generic like the car park area in the opening of "Sudden Impact" did not rely on any concept art at all and allowed me to design the area from start to finish.

Which environments have impressed you in other games you have not been involved with and why?

I was really impressed with the opening level in *God of War 3*. The fact that the levels are stunning environments and animated characters

at the same time really floored me, especially considering how flawlessly animation and physics work together. The first time I saw something like that was in *Shadow of the Colossus*, which I still consider one of the best games of all time.

Gears of War had some impressive environments as well. The amount of detail each mesh contains is just breathtaking and the quality of the assets themselves are great – a true inspiration for anyone working as an environment artist.

Tell us a little about the background behind *Black Mirror 2* and *The Guild 2* and how these titles compared with working on the recent *Crysis 2*?

Black Mirror 2 is a classic point and click adventure game for the PC. It's based on static background images with 3D characters moving on top of them. Environment art production was fairly straightforward since the background plate was a flat 2D image file that is always seen from the same angle.

This simplified many things since you could treat the entire scene like a matte painting or a movie



set, not having to worry about technical aspects. Anything that was not visible from the camera perspective did not need to be modeled and you could paint on the final image in post-production easily modifying the look and feel of the scene.

The Guild 2 is a medieval life simulation and strategy game that uses the Gamebryo Engine. Regarding art production it was more comparable to *Crysis 2* than *Black Mirror 2*. Each building is a 3D mesh with three different development stages based on each other. All buildings shared two 2048 x 2048 pixel textures for the entire game, which meant we had to be really efficient in our texturing and reuse a lot.

Each of these titles presented their own challenges that were vastly different from *Crysis 2*. The main difference is that both *The Guild 2* and *Black Mirror 2* were PC-only games that targeted a very specific audience whereas *Crysis 2* is a multiplatform title with much higher production values that needs to appeal to the mass market.

SIMON FUCHS

For more from this artist visit:

<http://www.simonfuchs.net/>

<http://ixenoni.cghub.com/>

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Interviewed by: Rich Tilbury





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3D CHARACTER DESIGN SERIES WITH SCOTT PATTON

In this two volume series, Scott Patton shows the processes he uses to create a 3D character for feature films. The first volume explores Patton's fast and efficient method for concept sculpting, skipping the 2D sketch phase all together and designing the character entirely within ZBrush®. He covers everything from blocking out the forms and fleshing out the muscles, to adding props, detailing with alphas and posing the character. The second volume covers methods for creating a final color rendering using ZBrush and Photoshop®. Patton shows how he squeezes the most from ZBrush's powerful renderer to create both a wide and close-up shot of the character. He then shares creative Photoshop tips and tricks to quickly get to a finished piece of concept art from the ZBrush renders, covering topics such as adding and refining skin texture, hair, eyes, shadows and scars. Patton also discusses how to create backgrounds that enhance the character and overall composition.




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Titouan OLIVE

Hill Digital

Juan Siquier

Fred Bastide

Sébastien Czaja

Victor Hugo (Vitorugo)

Jacques Pena

Igor Kudryavtsev

The Gallery

MIDDLE EYE: APOCALYPTO

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WC

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ERIK'S FIRST... OH, WAIT.

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OH58 FIGHTER

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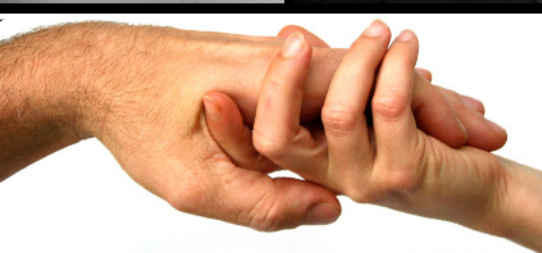
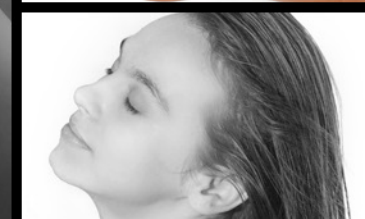
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MODELING FEATURES OF THE HUMAN ANATOMY

CHAPTER 4 - HANDS



Modeling the features of characters is something that has caused problems for many artists over the years. A good model can easily be spoiled by an incorrectly modeled feature, such as a hand or an ear. This eBook offers a step-by-step guide to help you make sure you never struggle with feature modeling again, presenting detailed chapters that have been written specifically for 3ds Max, Maya, Cinema 4D and modo.

COMING UP IN THIS ISSUE...

This month our artists will show you how to model hands.

So if you're interested in seeing the forth chapter of this great series, please flip to the back of this magazine and enjoy.

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 MAYA - PAGE 074

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Creating the Concept and Modeling

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Mapping

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Rendering and Presentation



LOW POLY CHARACTERS

Low poly characters with painted textures can seem a little old school at times, but in this series Tamara Bakhlycheva embraces the old style and shows us how to do it well with fascinating results. In this series Tamara will walk us through the entire process from the basic modeling through to the texture painting and posing. Most of the steps will be taken in Maya, but there will also be an opportunity to look at the benefits of using other pieces of software in your workflow.



CHAPTER 3 - TEXTURING

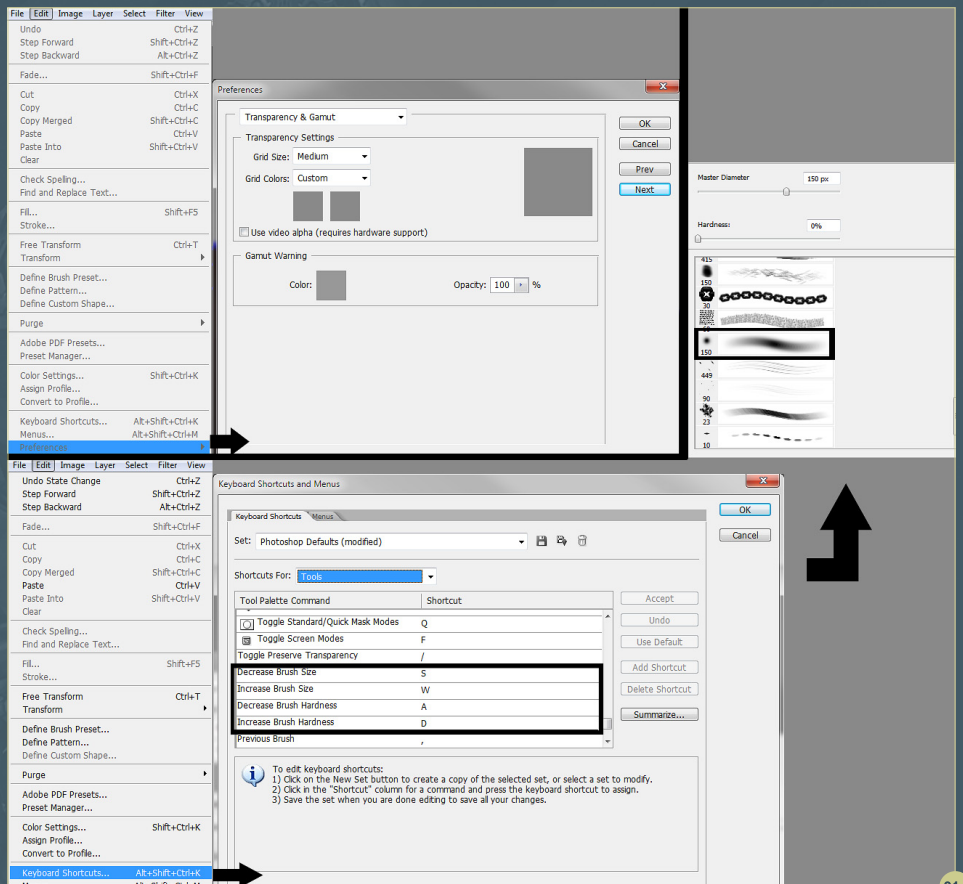
Software used: Maya, Photoshop, ZBrush, Deep Paint, Marmoset Toolbag, Adobe Premiere and Faogen

So far I've created three base PSD files for three textures. I always put a layer showing the UV wires on top of each PSD; usually it's turned off, but for the first stage it helps to select and fill the texture pieces with flat colors. There is also a directional AO set to Multiply and a default AO in Overlay mode. The rest of the layers are set to Normal mode. I'll work with them first (**Fig.01a**).

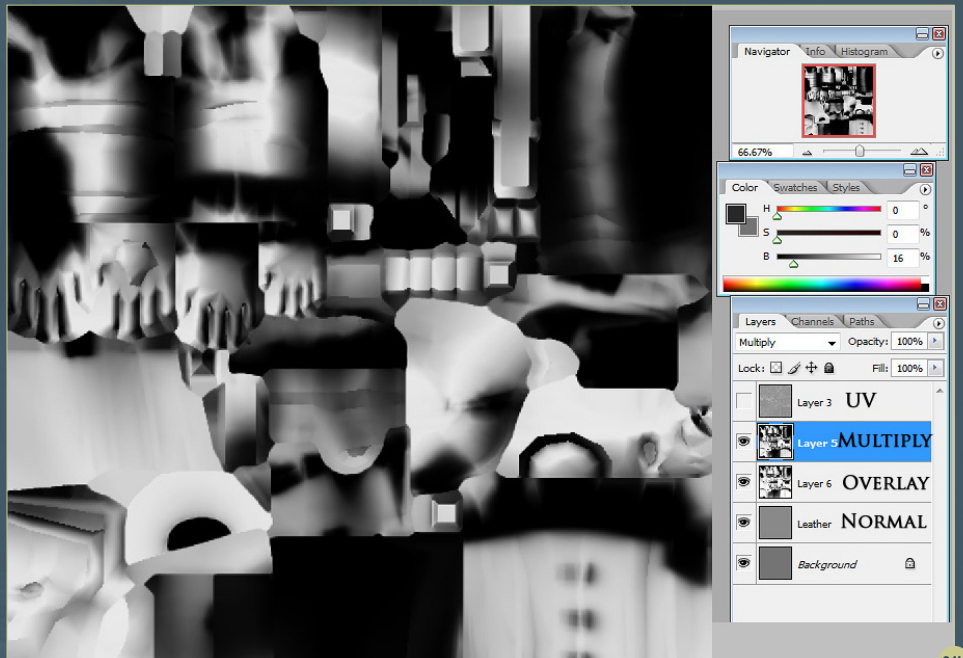
Take a look at some of my Photoshop settings. The default background usually looks like an annoying checker pattern so I change the colors of each square to the same grey color. When texture painting I always use a simple round brush, but with special hot keys set. When I work I often change the size or hardness of my brush. For example, a brush with hard edges is better for painting details, and a brush with smooth edges is good for first steps or painting shadows and smooth gradients (**Fig.01b**).

I used a new layer with a different color for each type of material. All of them are set to Normal. To select each piece I used the Polygonal Lasso tool. If you hold down Shift you can add new selections without losing previous ones. By pressing Alt you can delete part of a selection (**Fig.02**).

On the head texture I'll show how to work with Deep Paint 3D. There are a few other programs with similar projection texturing features – even the latest Photoshop has 3D texturing support – but I prefer good old Deep Paint. I will show you



01a

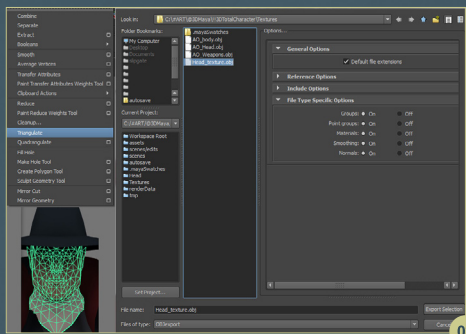


01b



02

how to draw textures using projections from this program in conjunction with Photoshop. Why Deep Paint? This software doesn't require a lot of computer resources and it rarely crashes. You paint your texture directly in Photoshop with the brushes and tools you are used to working with. In my opinion this program has three main downsides. Firstly you have to switch between Photoshop and Deep Paint every time you need to take or apply a new projection. Secondly, it doesn't support alpha channels correctly,

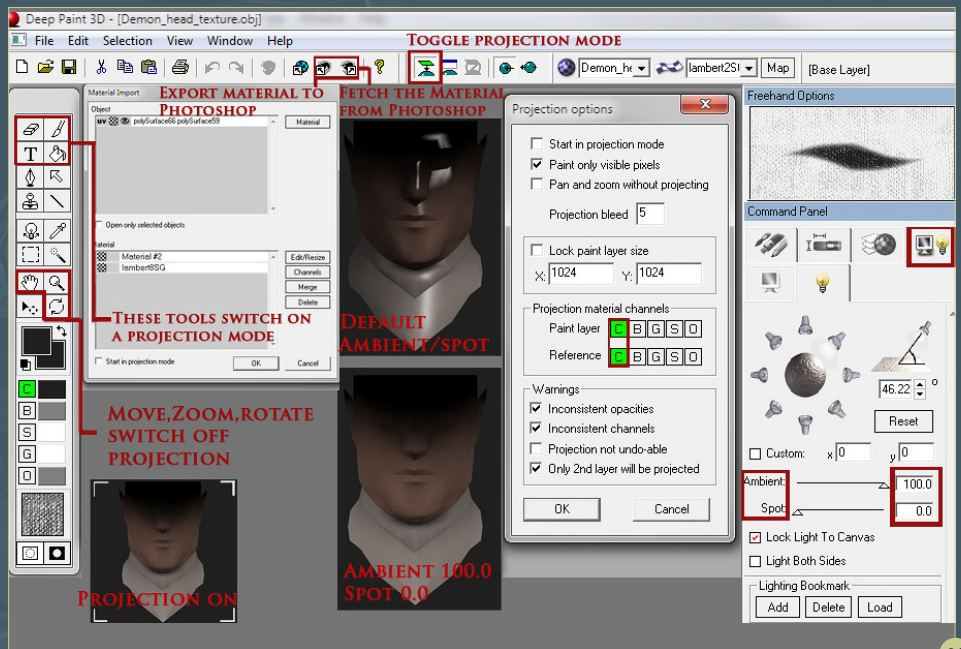
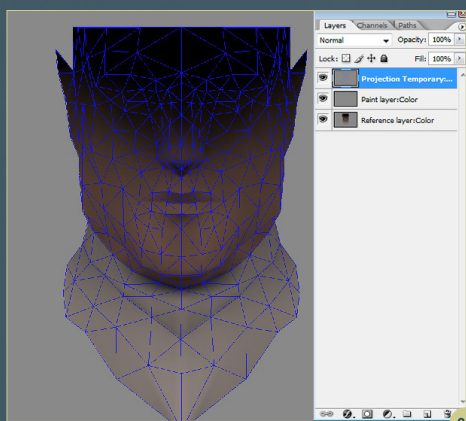


and lastly there are issues on the symmetry seams – I'll talk about that later. Anyway which program you choose is up to you, but this tutorial will help you to find out more about Deep Paint.

Deep Paint has different triangulation algorithms; it is not like in 3ds Max or Maya. As you may know, every quad consists of two triangles and these are polygons that your computer processes. Quads are for our human comfort.

Once you have exported your quads into Deep Paint, you'll be able to paint the texture, but on your main program you'll probably see some errors with your texture. This is because Deep Paint doesn't triangulate in the same way as Maya. To counter this we'll triangulate our model before exporting it to Deep Paint. Make sure that your working meshes for Deep Paint are located in the same folder as your PSD textures (**Fig.03**).

In **Fig.04** I've framed with red all the main options. When you launch the program for the first time you'll need to turn off all types of layers except for C (color) in the Project options menu.



Usually I use 1024 x 1024 as the size of the projection. The first window that you'll see is a Material Import window. All that you need to do is press OK, but if you didn't save your OBJ in the same folder as the textures it'll probably ask you to choose the texture destination, so to make your life easy keep everything together. Next what we need to change is the light settings. The default settings apply a shader which we don't want as we are going to hand-paint the texture with shading materials. Change Ambient to 100 and Spot to 0.

Deep Paint 3D has two modes – View and Projection. View is the standard mode with Zoom, Rotate and Pan tools. When it's active you can see purple staples around your model. Projection mode will freeze the model in one position and will place it in a special temporary PSD file in Photoshop. When it is active the staples are white. Using Zoom, Pan or Rotate will switch the model back into View and will apply the current projection PSD to the model. If you turn on Toggle Projection mode, you will still be in the View mode. To enable Projection press Eraser, Freehand or Fill; I usually press B for Freehand. Now when your model is frozen press the arrow above Export Material to Photoshop. Deep Paint will open the PSD automatically in Photoshop. If you want to get the projection

back from Photoshop press the right arrow on Fetch the Material from Photoshop. As you will have noticed Deep Paint has its own tools for painting, but they are not very good. Obviously Photoshop is much more powerful.

Fig.05 is how the temporary PSD file will look. It always has three layers which are as follows:

- Projection Temporary: Wire Frame – this shows the wireframe of the model
- Paint layer: Color – you can add further layers to this
- Reference layer: Color – this is the current texture view

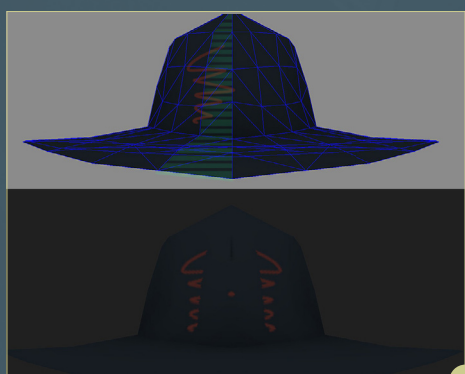
While you work you can create new layers, but at the end before applying the material in Deep Paint you should make sure you still have the original file names. Deep Paint will take all the new information from the Paint layer: Color layer. It will ignore all another layers and any changes to the wire or reference layer. So if you painted something, for example, on the wire layer (which sometimes happens) don't worry – Deep Paint doesn't use that information. All that you should do before applying the projection is to save it in Photoshop (Ctrl + S). After that go in to Deep Paint and press the magic arrow that says Fetch the Material from Photoshop. The

old texture will now change to the new one and that operation will not be Undo-able. To switch to View mode and apply your texture to both symmetry parts use Pan, Zoom or Rotate.

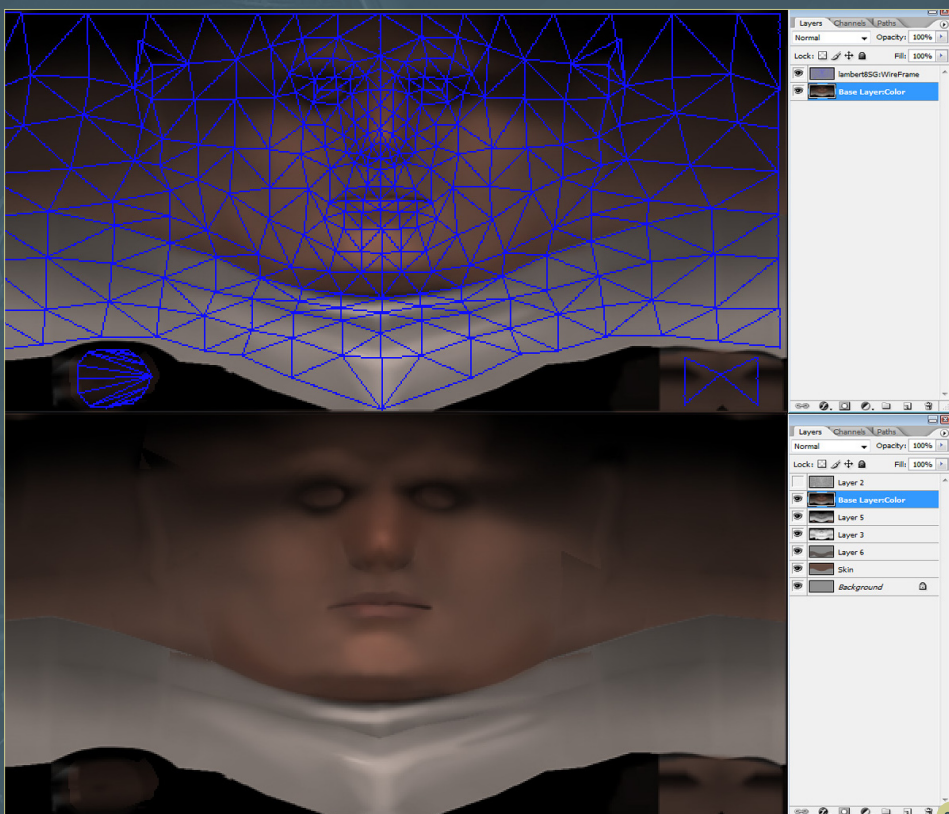
Now I'll tell how to get your texture after making some changes. In View mode activate Toggle projection mode then press Export Material to Photoshop (don't press Freehand because it will switch to Projection mode). Deep Paint will export the texture with the wireframe and diffuse layer. You'll need to move the color layer into your main PSD file. You can also work with the temporary texture from Deep Paint; just keep the default names. You can apply changes the same way as you did with the projection. I usually put a new diffuse layer above the AO. I always keep the original layers just in case I need them later. Every new diffuse layer goes above the last one. The PSD can contain about 60 layers. Always make a backup for all your main working textures (**Fig.06**).

I have mentioned before about errors on the symmetry seams. That happens if you work with a symmetrical model and paint the wrong half of it. Usually if you work with the main right side of the model and set the left side to Instanced you get the best results. As you can see in **Fig.07** I did it on the left-hand side and I got that error. Always make sure you're using the right side before starting.

Don't forget to make sure that there are no Maya shaders in the viewport. It's the same as we said earlier in Deep Paint – go to the Lighting tab then No Lighting to turn it off.



07



06

Fig.08 shows my first pass for the head. It's not a final version because it's better to add details when doing the final polish for the whole mode. On the first phase we can paint some rough light and shadows. After that add the skin colors and remove the grey tints. Don't forget that skin can be red, yellow or even green with a blue tint. It

depends on which part of the face it is. Always use a reference of a human face. I spend a lot of time searching for photos of actors or people who have similarities with the character I am working on. I also tend to slightly deform the face using Soft Selection to make everything look the way I want it to.



08



With this image I didn't have much of an idea about the final color choices so I started by using brighter colors and desaturated them later. It's much easier to desaturate textures than to saturate them. I drew a line and erased segments to make it look like stitches. I also added volume by adding small highlights. Don't use too many light or dark colors on large areas of your texture. It makes the texture look flat (Fig.09).

There is a small trick for lazy 3D artists like me. If you have a good and highly detailed concept you can use some parts of it for your texture. I did it for the skull pattern on the back of the jacket. I cut it from the concept and colored and refined it (Fig.10).

The shoulder pad is a complicated part of the costume. For these kinds of details I prefer to start in grayscale. I painted some simple volumes first as colors at this stage only distract me. After that I used layers in Color and Overlay mode to add the color (Fig.11).



I added additional colors to the seams, shadows and other places with one final pass (Fig.12).

The metal should be dark, not light as some artist like to have it. It is highlights that make metal look like a metal, and these highlights should be small. There are a few different tints

on the glove. These also are metal-looking. Photo textures are a good helper if you want to learn how to draw metals (Fig.13).

There is another example of lazy texturing in Fig.14.

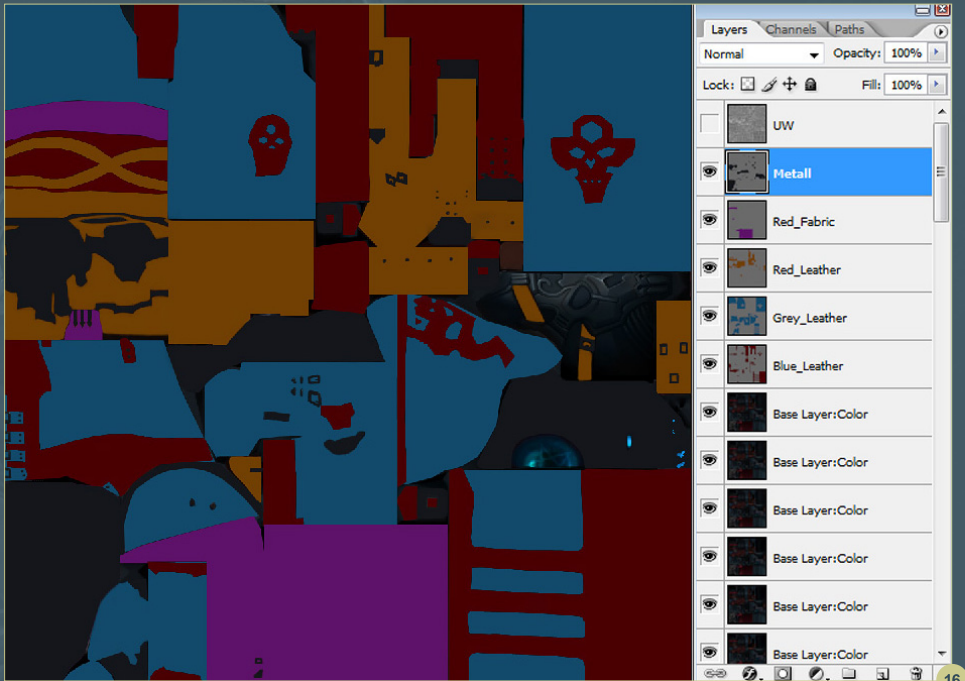
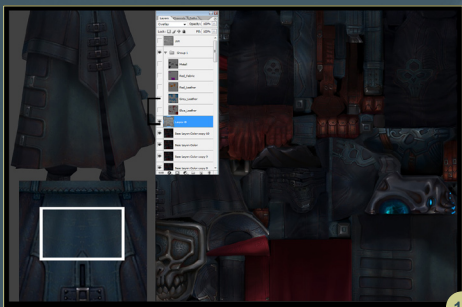


Fig.15 shows some samples of the textures on the coat. The stitches are slightly oversized. When they are this size they are more noticeable. The leather belt was done using normal mapping and it was painted in the normal way without the use of Deep Paint.

When I finished the first pass for my textures I created a few masks for each material to use for color correction in the future (**Fig.16**).

The next step was to refine my texture. I would like to show you how the Sharpen Filter works in Photoshop. As you can see, it makes lines of light and dark pixels on the border that contrast between the darks and lights. This creates an illusion of sharp and neat detail (**Fig.17**). We'll use that filter later on the final texture, but we also need to add this effect manually on our texture. Try to paint the darker and lighter spots on the texture carefully. I added new volumes and colors at this stage as well, for example the red in the seams of the coat.

When I was satisfied with my hand-painted texture I added some photo textures. Usually they are added in Overlay mode, making good use of the masks. I made corrections using the Eraser tool. Avoid large symmetrical noise on the seams and keep in mind that dirt stays mostly in cavities. With photo textures your hand-painted texture will look more interesting, because photo textures add more colors and



noise. You can find free textures here: www.freetextures.3dtotal.com or here: www.cgtextures.com (**Fig.18**).

Now it's time for a final head pass. We'll use a photo texture too. You can find good photo

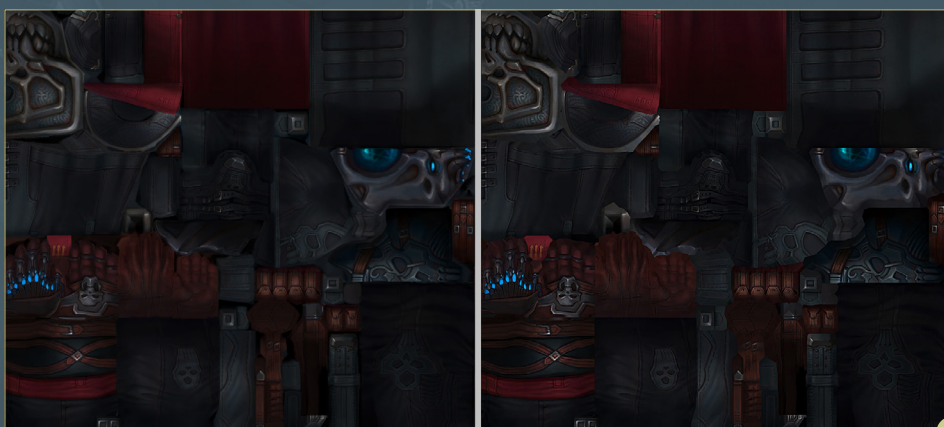
references for textures on the web or you can take a picture of a friend or relative as I did. Photos have to be taken with flat light (no strong shadows or highlights). You will need to adjust the color balance on the photo closer to your texture. I used a Quick Mask for each part of

the face (Q). Apply Gaussian Blur and make a selection (Q again). That selection will have a smooth clean border. Copy the eyes onto a new layer and place it on your face projection with the texture in Normal mode. Repeat that operation with the other parts: lips, nose, cheeks etc and merge them down onto your projection in Paint layer: Color (remember the layer names). Apply the projection and take that texture back to Photoshop. Carefully mix the new photo texture with the old painted texture (turn the opacity down and erase some parts). After that your texture will become more detailed and realistic. I made another pass before the final refine. I decided not to make this face too old, because the character is an elf, so I tried to combine scars, marks and clean skin (Fig.19).



The texturing on the weapons follows the same process: base, marking, main volumes, manual sharpness and photo texture (Fig.20).

When the textures were ready I did one more thing. I exported the model into ZBrush and applied my texture there. Firstly flip the texture



vertically because ZBrush has a different texturing processing. Apply the texture to the mesh and change the UV Map border to the maximum amount of 16 (UV Map menu). Press Fix Seam in the Texture map menu. Clone the texture and Import the newly created file to Photoshop (Fig.21).

As you can see, ZBrush filled all the unused space on the texture by smudging pixels to the borders. That helps us with two things; it removes the visible texture seams and makes your texture look neat. Flip back the texture from ZBrush and use the Smart Sharpen option. In Fig.22 the texture on the left shows how it looked before this was done and the one on the right after.

On the Specular map there is a big difference between the metal and other materials. The metal has super-bright highlights as it's going to look shiny in the render. The color doesn't matter much here, because Marmoset has its own specular color settings. And again the masks for different materials that we prepared before will help us a lot. I decided to make blue eyes on a Glow map because the hat casts a shadow and regular eyes were not visible on the render (Fig.23).

TAMARA BAKHLYCHEVA

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Or contact them at:

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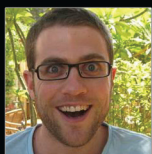
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CARTOON ANIMALS

Creating cartoon animals is a great starting point for anyone who is thinking about having a go at 3D. Cartoon animals are usually made up of shapes and forms that are fairly simple to model and since realism is not the focus of this kind of work, it gives you an opportunity to be expressive and experimental at all points of the creative process. In this series our artists will be talking you through how to approach this task, firstly by concentrating on how to create your idea, but then moving on to the modelling, texturing and post-production. Each chapter provides you with an opportunity to see into the workflow of these industry professionals who will give you a priceless insight into what is a huge part of the CG industry.



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OCTOBER ISSUE 074 Chapter 04 | Scorpion NOVEMBER ISSUE 075 Chapter 05 | Squid DECEMBER ISSUE 076 Chapter 06 | Sloth

CHAPTER 01: MOSQUITO

Software used: 3ds Max and ZBrush

Hello, my name is Marcos Nicacio and I'll show you the process I used to produce this cartoon character, Captain Mosquito.

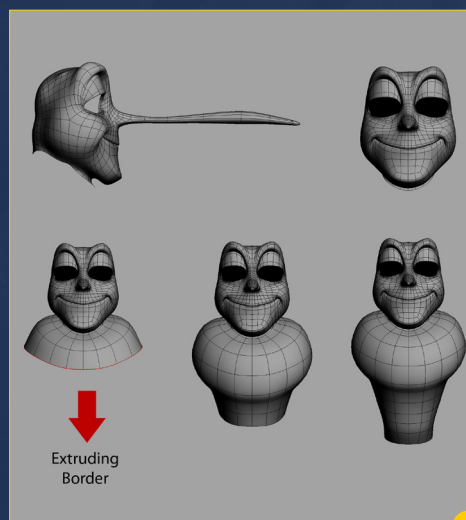
REFERENCES AND CONCEPT

When I was invited by 3DTotal to produce this tutorial, they offered me the chance to make a cartoon character with some individual characteristics, in this case a mosquito. I thought it would be cool to make him like those old style pilots with traditional hats, big chins and a friendly smile on his face.

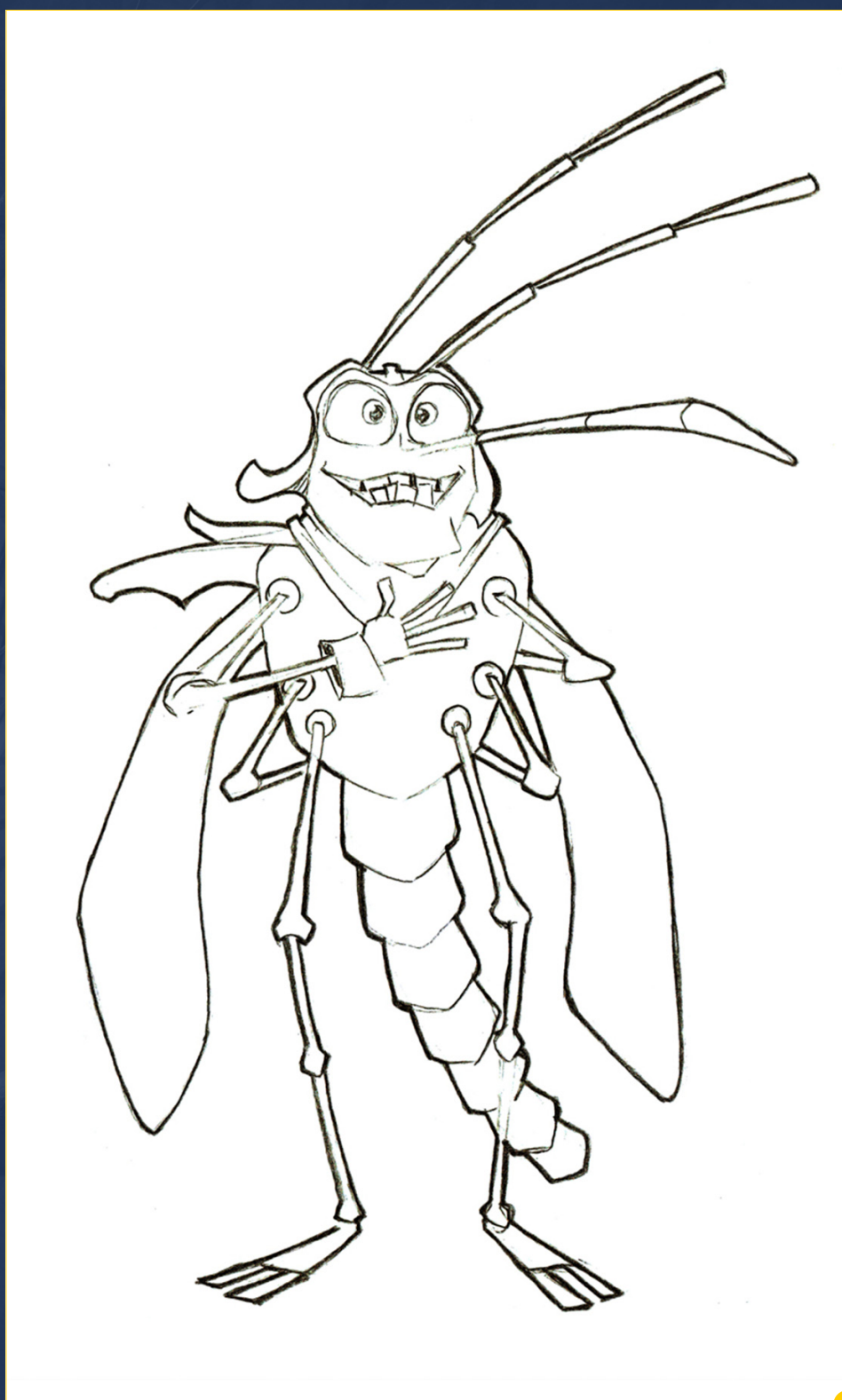
I looked for references of old pilots and their clothing as well as flies and mosquitos, including cartoon characters like those in the bar scene of the movie *A Bug's Life*. I'm not great at drawing, but I'm working on it. For this concept I asked a great friend of mine called Roberto Moreira to draw a concept based on the references I found. This concept helped me a lot. **Fig.01** shows the concept that is based on my references.

MODELING

I always start by modeling the head and depending on the circumstances I use poly by poly or box modeling. In this case I used poly by poly modeling to have total control of the edge looping on his face. After I finished the head



02



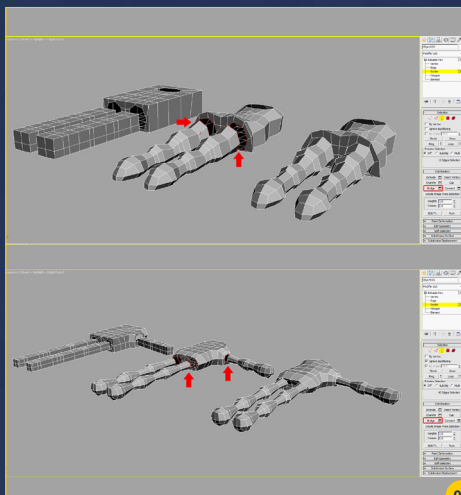
01

I selected the border of the neck region and extruded down. To do this press Shift + hold the left button and drag in the direction you want to extrude (**Fig.02**).

The same technique was used on the antenna, arms and legs. I extruded them and gave them

shape by selecting vertices and scaling them. The accessories like the hat, scarf, glasses, wings and little spikes on his body were also modeled using this technique.

For the hands and feet I changed the way I modeled. I started with a box to model the hand,



03

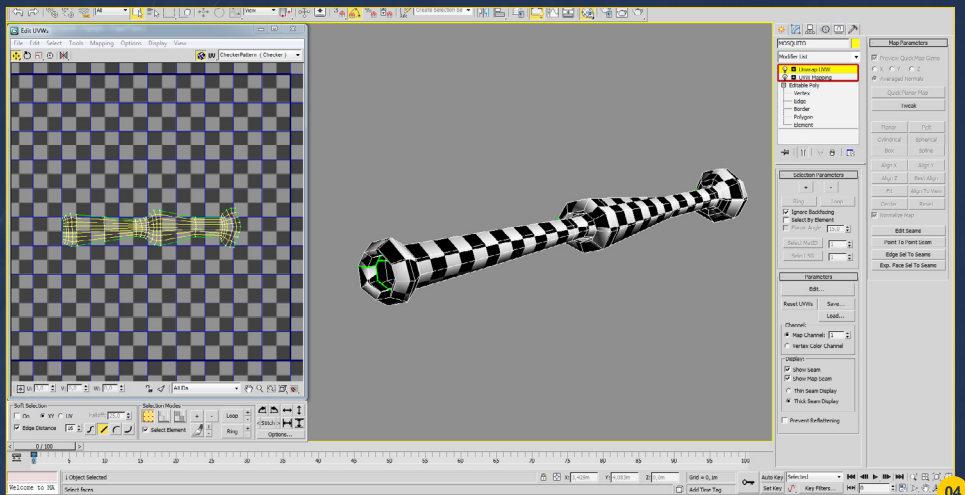
foot and fingers, and used the Connect tool to adjust the edges and create the shape I wanted. To attach pieces I used the Bridge tool (**Fig.03**).

The mosquito's hair was made using the Hair and Fur modifier. First I took the polygon on top of his head and added the Hair and Fur modifier to it, creating the hair and pulling it all to the front with the Translate tool in the Styling tab. Using the Puff Roots toll I gave the hair some volume. Then I used the Translate tool again to brush and shape the hair into a 1950's style.

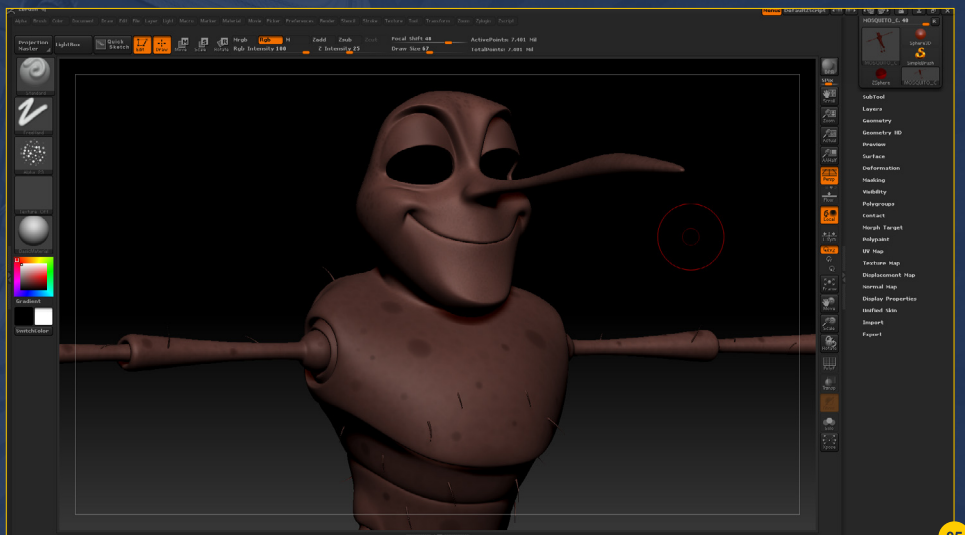
TEXTURING AND SHADING

To start the texturing process I opened the UV using UVW mapping and an Unwrap modifier. Firstly I applied the UVW mapping and used the mapping mode, which is more compatible with the object shape. You can see how I did that on the mosquito's arm in **Fig.04**. I added an Unwrap modifier to make a few adjustments with the Relax tool and weld the unattached vertices.

Next I split the mesh into named parts like the body, head, hand, leg etc. UV unwrapping can be a little bit boring and slow, but it will become



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easier with practice and there are specialized pieces of software that can help speed things up. Once the UV was done, it was time to start texturing.

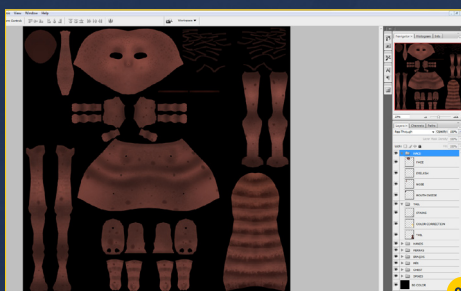
I'll show you how I made the Color and Bump maps that I used to texture this character. Firstly I exported the body mesh as an OBJ file to paint in ZBrush by selecting the object and exporting the selection. Choose the OBJ extension, choose ZBrush as the preset and Export.

In ZBrush subdivide the mesh seven times and change the shader to the basic material so you can see the color better when you use the Polypaint tool. I used this to block in the color and add details like the little dots and scratches on the mosquito's skin. By creating the Color map in ZBrush I avoided having problems with seams in my texture (**Fig.05**).

The next step was to export the color texture from polypaint with a resolution of 4096 x 4096 to Photoshop and do a few little adjustments to the brightness and contrast. Still in Photoshop I separated the color texture into folders with the name of each part of the body on them to organize the files and have maximum control when I added details (**Fig.06**).

The color map was done now so I used it to create a Bump map by removing all the saturation and then using Levels, Brightness and Contrast adjustments layers to get the right black and white map. To conclude I gave the Bump map some scratch details on the top layer, which was set to Overlay blending mode.

All the other parts like the wings, scarf, hat and the glasses were rendered using a Solid map with a Unwrap modifier just to get the color.



06

I used the same process that I did with the mosquito's body, split the parts into sections inside Photoshop and worked on the detail on each map, for example the leather texture on the hat's Bump map.

The mosquito's body, eyes and accessories shaders are really simple V-Ray materials with variations in reflection, opacity, glossiness and bump. Here is an example of the mosquito's body, scarf, wings and hat shaders layout inside the Slate Material Editor (Fig.07).

RIGGING AND SKIN

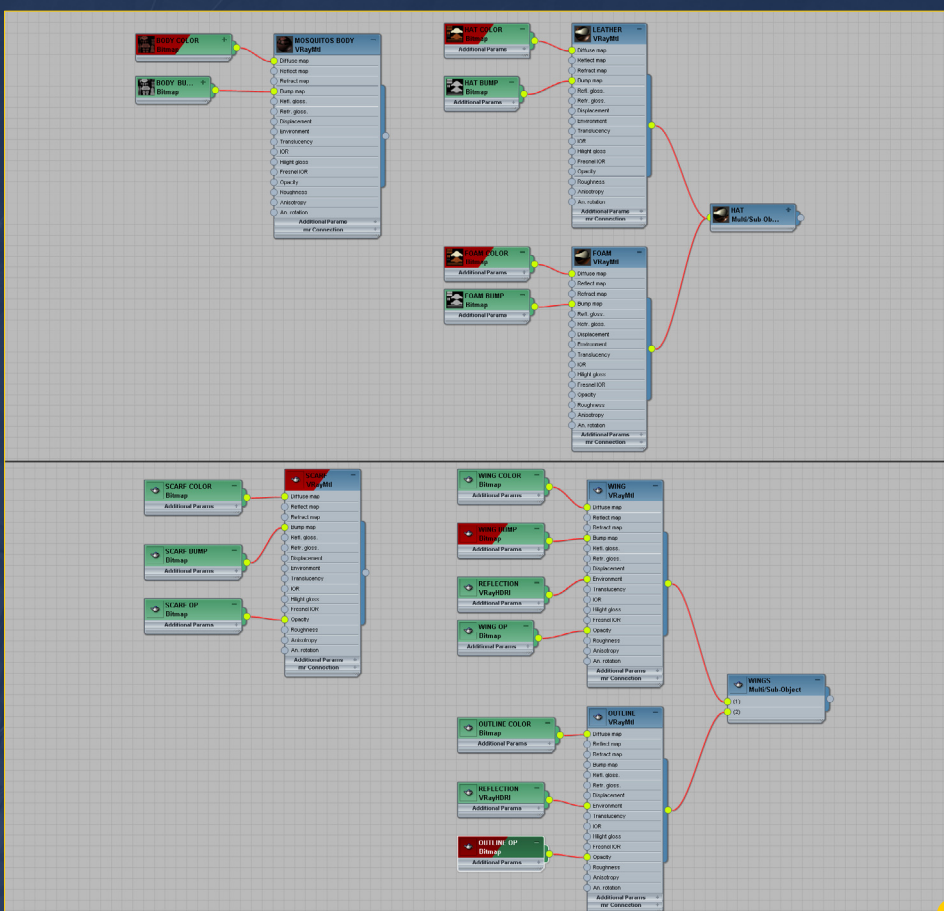
When I start the rigging process I always think beforehand: what's the character for? To pose the mosquito I needed something basic because he didn't need to be animated, just a simple pose for a still image. A rigging setup using Character Studio would be more than enough. I did add few extra bones to his nose. I adjusted his facial features and the antenna were done with a basic Bend modifier. The hat and glasses are linked to the head bone and wings, and the scarf to the top of his chest bone.

Here is a tip – before you add a Skin modifier centralize the pivot in your mesh and apply a Reset xform (inside the Utilities tab) to clean up your mesh vertices and make it 1 by 1 in 3D world space. It helps you avoid having problems in the skin process, mainly in Mirror mode.

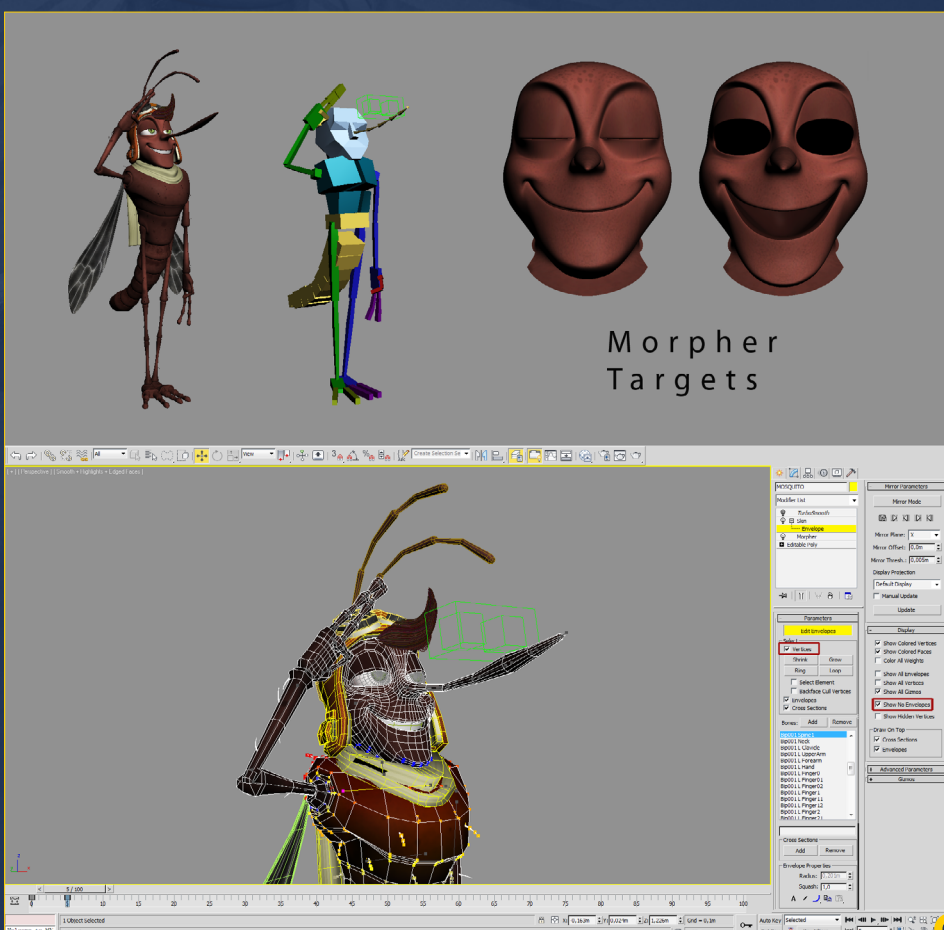
In the Skin modifier parameters I began checking the vertices option to make the selection of the vertices possible and then changed the weight of each bone. I also removed the Show No Envelope option in the Display tab to make the interface easier to work with (Fig.08).

LIGHTING AND RENDER

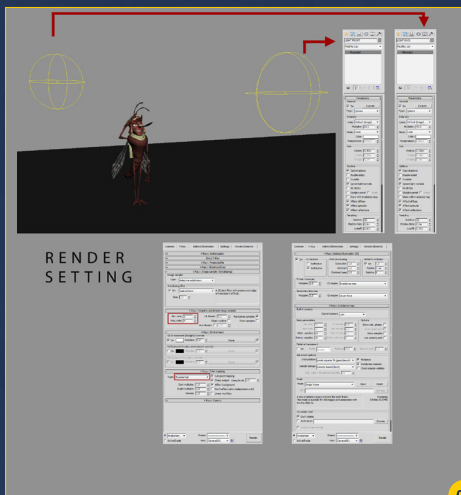
The lighting setup is quite simple too. I used two V-Ray lights, one stronger in front to give a highlight to the mosquito's face and the other was a little weaker on his back.



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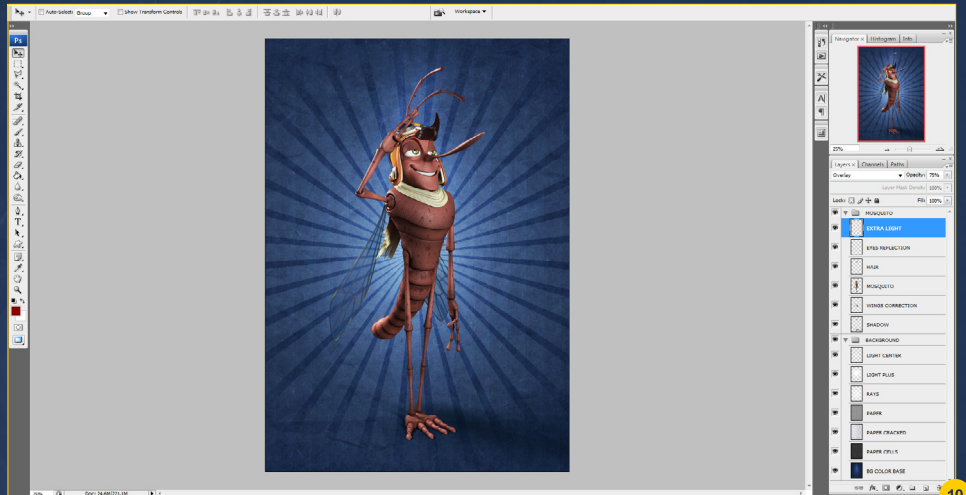


09

Before I explain about the render settings it is important to say that the character is over a matte plane to get the shadow, alpha and GI on him. To set matte in an object just right-click on the plane and check Matte Object, Alpha Contribution -1 and Shadows and Alpha.

For the render setting I mainly changed the color mapping to Exponential and checked the Clamp Out and Sub-pixel options.

The other important changes that I made to the render settings were inside the Adaptive subdivision image sampler; I like to use Min. rate = 1 and Max. rate = 4. It makes the antialiasing smoother without any serrated



10

problem on the final render (**Fig.09**). To better control the post-production in Photoshop I did a unique render of the body, hair, wings and a last pass for the shadows with the render elements.

POST-PRODUCTION

This is one of my favorite parts of the process. Here is where you can use your imagination to create a background and practice your knowledge of lighting and photography. Inside Photoshop I split my image into two treatment groups, one for the background images and textures and the other group for the mosquito.

In the background group I used seven layers. It may sound like a lot, but they were all very

simple and each one helped to build my desired image. The basic color came first, then three kinds of paper texture, cardboard, cracked paper, and then some light coming from the center of the texture.

In the mosquito group I had six layers to control all the details that I wanted. The first thing to do was organize the mosquito's passes. This is the order I used from the bottom to top:

- Shadow
- Wing color correction
- Mosquito
- Hair
- Eye reflection
- Extra Light



11

I worked on the mosquito's body layer to adjust the brightness and contrast. The eyes looked a little lifeless so I added a layer with a little window reflection. I adjusted the hair and wings too, mainly for color and brightness. To finish I selected the alpha channel for the body and added some extra light using the Standard brush in Overlay blending mode. In **Fig.10 – 11** is a screenshot of the layers in Photoshop and a comparison of the raw render and the final composition.

FINAL THOUGHTS

Firstly, I'd like to thank the 3DTotal staff who gave me the opportunity to show my workflow. I hope this tutorial helps you create your next character.

MARCOS NICACIO

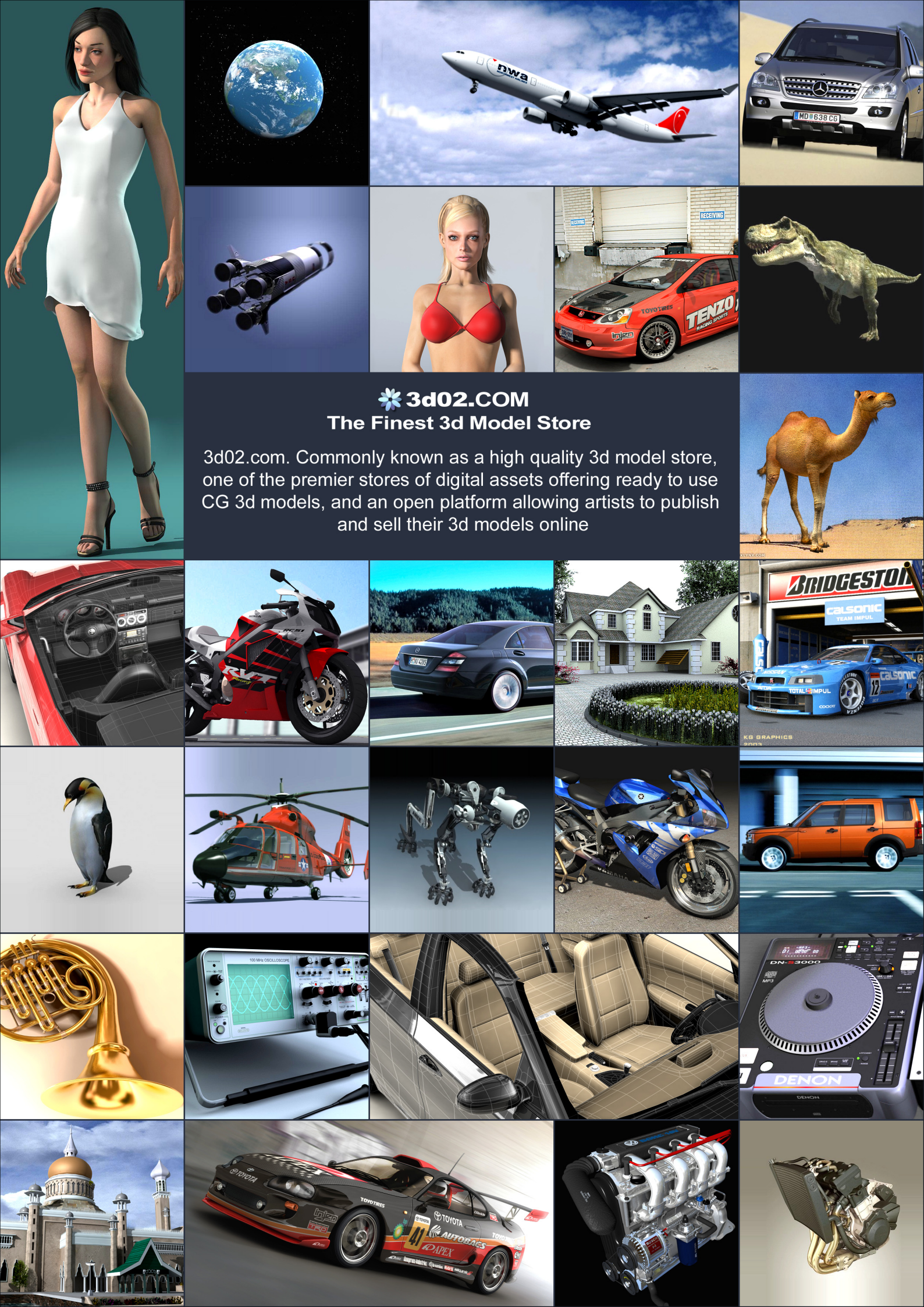
For more from this artist please visit:

<http://marcosnicacio.wordpress.com/>

Or contact them at:

m.nicacio@hotmail.com

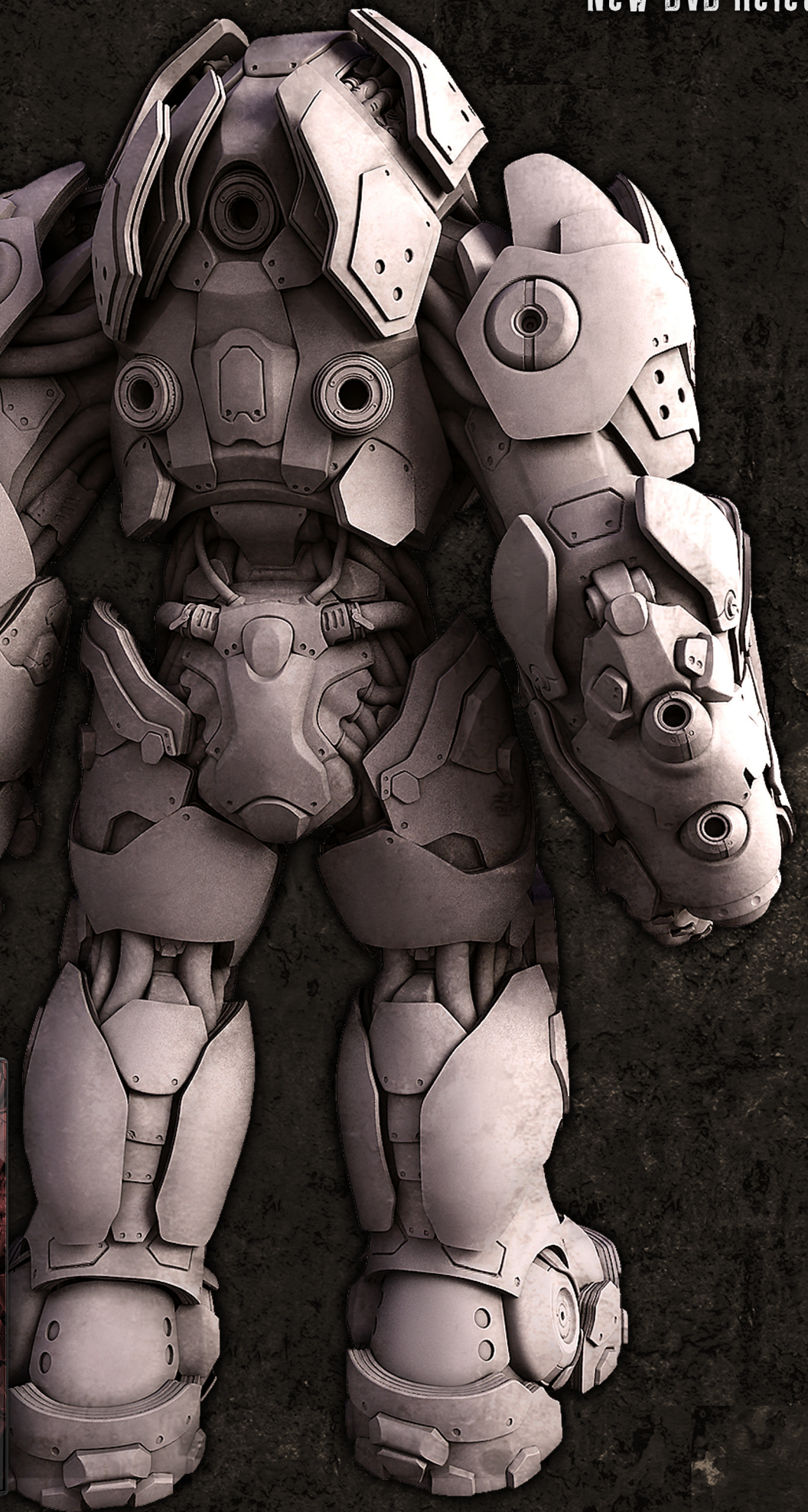




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Modern art in all genres is heavily influenced by its history. With the arrival of ZBrush came an opportunity to put into practice many of the techniques that were used in classical sculpture. In this tutorial series Rafael Ghencev will dissect the history of Greek and Roman sculpture and show you how to create an image in that style. Not only will Rafael talk you through the sculpting, but will also show how to texture and present your sculpt in a classical style. This series will also give some great anatomy tips, and provide you with some great tricks to help you present your sculpts.

CHAPTER 1 | APRIL ISSUE 068
Greek Sculpting

CHAPTER 2 | MAY ISSUE 069
Greek Sculpture Texturing

CHAPTER 3 | JUNE ISSUE 070
Roman Sculpting

CHAPTER 4 | THIS ISSUE
Roman Sculpture Texturing

CHAPTER 4 - ROMAN SCULPTURE TEXTURING

Software used: ZBrush

ROMAN BUST RENDER

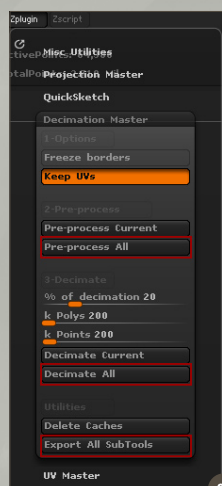
Welcome to the final chapter of the series where we will be looking at how we render the Roman bust that we sculpted in the last section.

DECIMATE THE MODEL

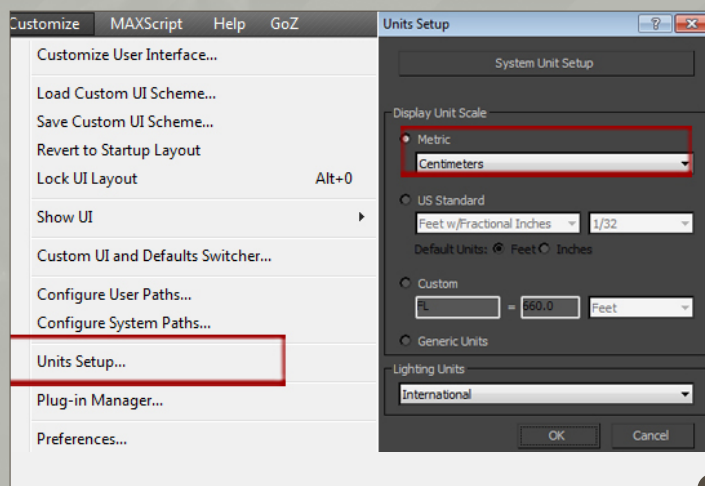
To start the render process we need to prepare our file and send it to 3ds Max, where we are going to use V-Ray as our render engine. So open your model, go to the Zplugin tab and open the Decimation Master plugin. We need to use this to reduce the poly count of the model. In the case of my image I have 9.7 millions polygons which is too many to open in 3ds Max. So to shrink the count put your model in the last subdivision level and choose the proportion of decimation you would like to use. In this case I use the default 20%. Now you only need to click on the Pre-process All tab and wait a while for the process to complete (**Fig.01**). After this process has finished simply click on the Decimate All tab to apply the result to the mesh and export the models as an OBJ file.

CREATING OUR SCENE IN 3DS MAX

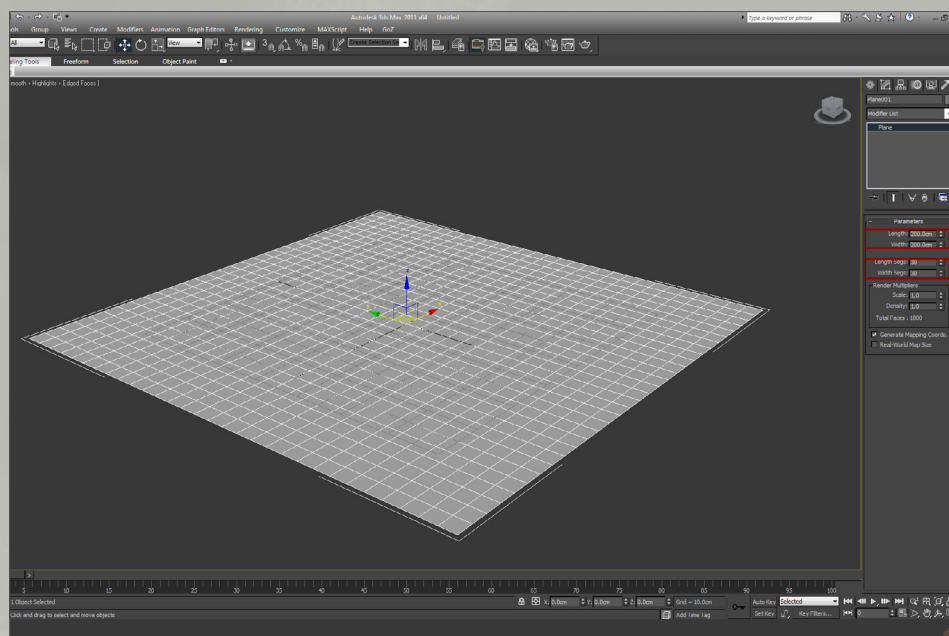
Inside 3ds Max we need to configure our scale to work in the real world. To do this open the Customize tab and select Unit Setup. Next configure the scene as it is in **Fig.02**. Now our scene is set to cm. Now we need to build



01



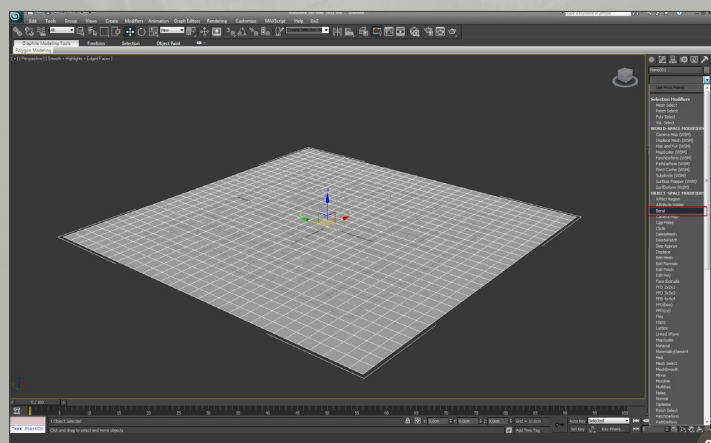
02



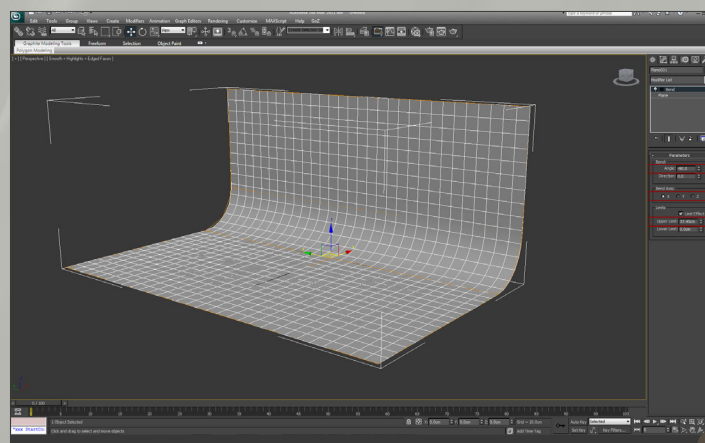
03

our infinity background. I decide to do this to simulate studio photography as I did in the Greek sculpture tutorial. Create a plane object in the Standard Primitive tab and set the scale of this object as it is in **Fig.03**. Now we need to apply a curvature to this plane to make our

studio background. So open the modifiers list and pick the Bend modifier (**Fig.04**). Now we need to adjust the Bend Axis to X, the Angle to -90 and turn on the Limit Effects. Once you have done this you can choose a good value that makes a smooth curve (**Fig.05**).



04



05

CAMERA ANGLE

Once you have moved your model into 3ds Max the first thing to do is define the camera angle. Create a V-Ray camera and configure it to 85 mm and change some of the options, for example the aperture (f-number), ISO and shutter speed (**Fig.06**).

This camera angle will be very important because your UV will be generated based on this. So take your time to decide what the right angle for you is (**Fig.07**).

LIGHTING

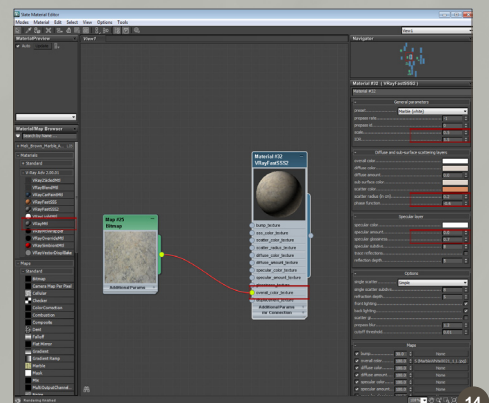
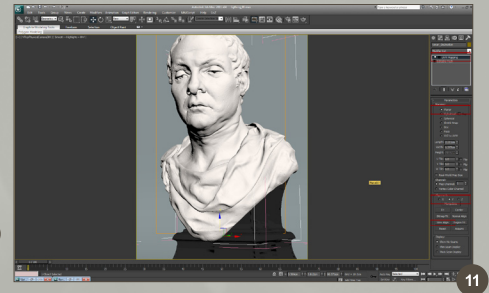
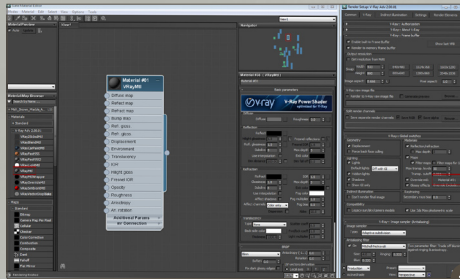
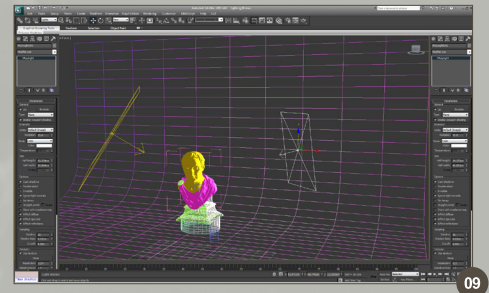
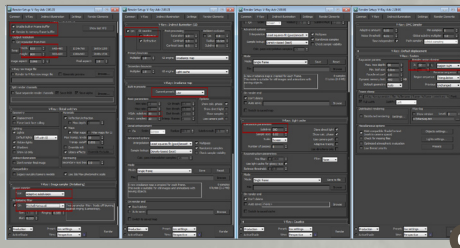
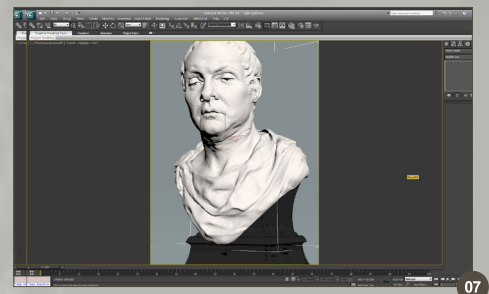
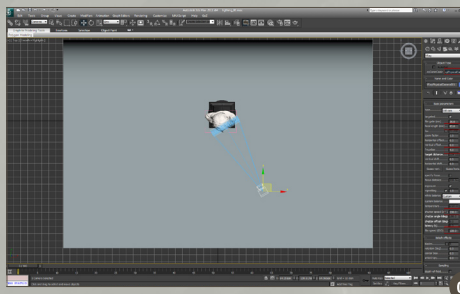
Now we are going to create the lighting so the first thing to do is configure V-Ray to make quick renders so we can see the tests quickly (**Fig.08**). Create 2 V-Ray lights and configure them as they are in **Fig.09**.

Now create a simple V-Ray material to do some lighting tests. To do this open the rendering Material Editor tab and create a V-Ray material with a gray diffuse color. Once you have done that put the material in the Override mtl slot in the Global Switches tab (**Fig.10**). Here is the result of the light test (**Fig.11**).

TEXTURE AND SHADER

Now it is time to create the texture, but before we do that we need to prepare the UVs to receive the texture properly. In the case of this image I am only making a still and not an animation, so I will do a simple Planar Projection through the camera. This will project my UVs so they work for my camera (**Fig.12**).

Now we only need to find a good marble texture to use on this project. I use a texture from: <http://cgtextures.com/> in this case (**Fig.13**). We only need to apply this texture to the Diffuse slot of the material. The planar map will do the rest. Remember this kind of projection works well for still images but not so well for animation. And in this case the scene has only one shader for the character, which makes things easy too.



Now we need to create the marble shader. Open the Material Editor (M) and select a V-Ray Fast SSS2 material. We'll use this to make translucent materials. To start this shader pick a preset. In the preset option select "Marble (white)".

We can change some parameters to create a little more natural look for this (**Fig.14**). In the specular amount I put 0, because I don't like to use the specular of this shader. So instead I do a blend with a simple V-Ray material that has great specular control. Before this in Photoshop

I use levels to adjust the marble texture to create my specular map (Fig.15). It will create an irregular specular on the surface. In some places there will be more glossiness than in others. Now we can create a simple V-Ray material with black diffuse and put the specular map in the Reflect map slot (Fig.16).

To do some tests with the specular included apply this material in the Override Mtl slot and click on render (Fig.17). When you have achieved a good looking specular you need to create a blend material to mix the materials together. Go to the Material Editor and create a new blend material and link it to the SSS2 shader at the base of the blend material. Then link it to the specular material in Coat 1 of the blend material, then set the blend mode to 60% (Fig.18).

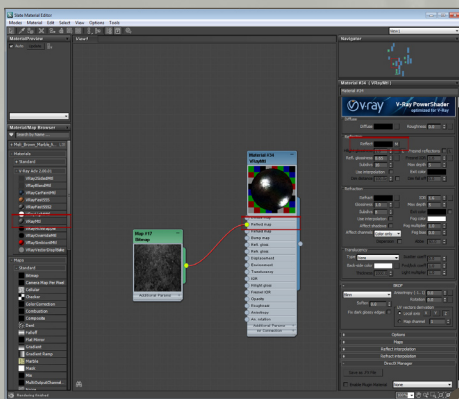
RENDER SETUP

Now we have our material completed, we need to change the render parameters to achieve a good quality render (Fig.19). And that is it!

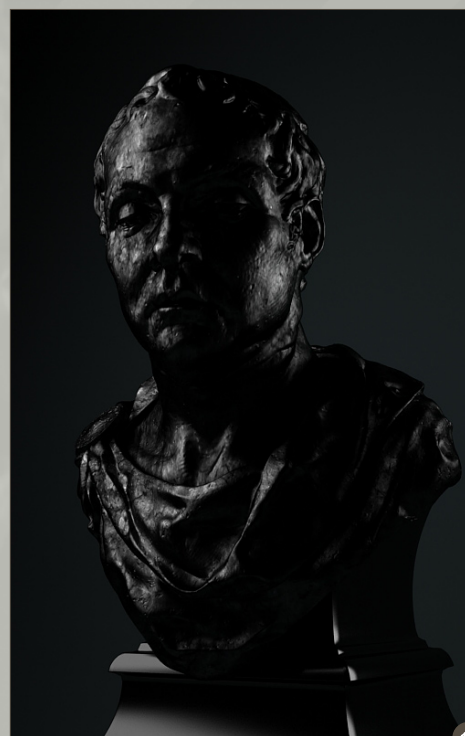
If you like, you can adjust the levels and color in Photoshop. And here it is the final image



15



16



17

(Fig.20). I hope those tutorials have helped you guys, and I hope you like the final product.

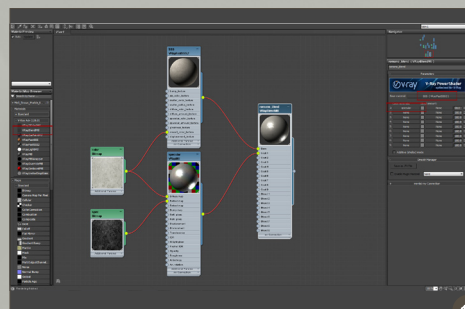
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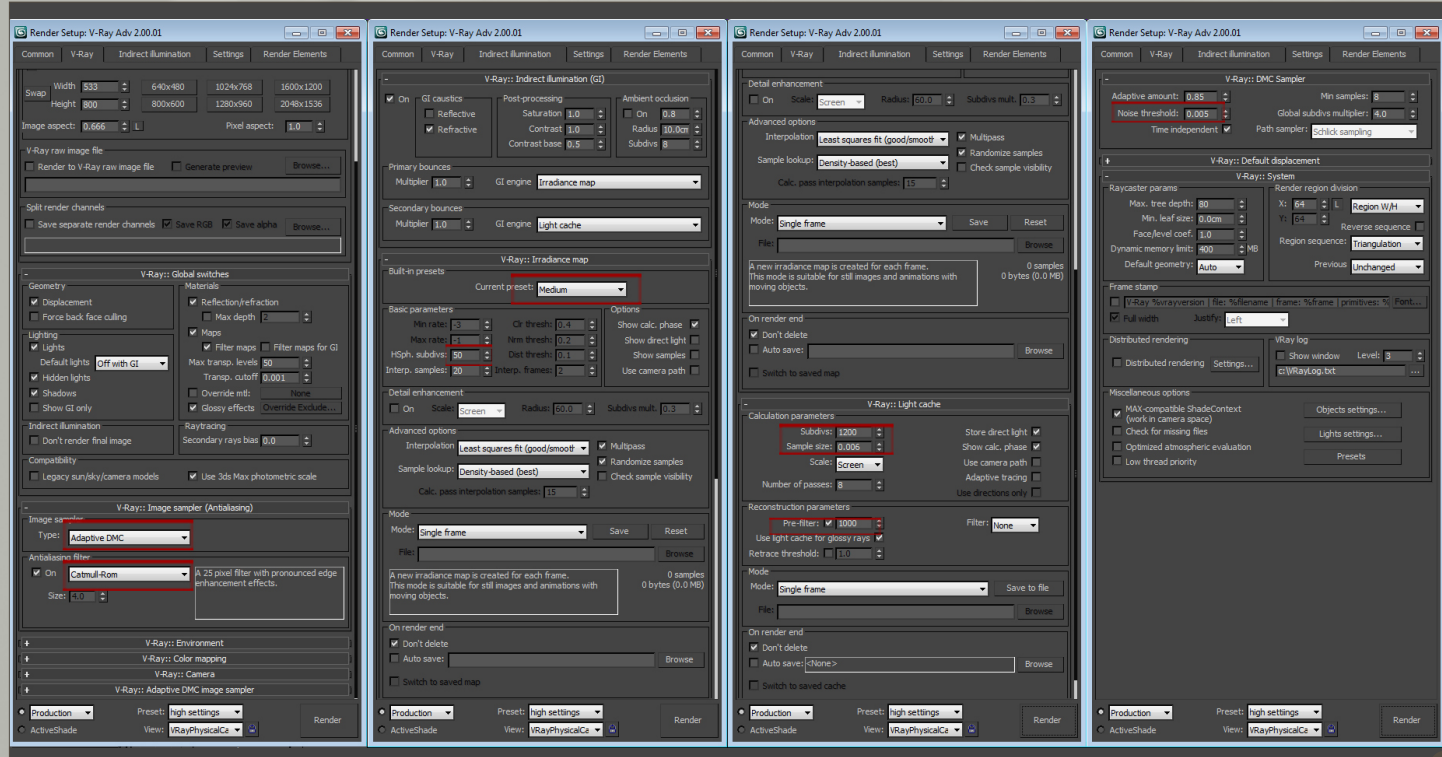
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BRAZIL



RONALDO FENOMENO

**MAKING OF BY
BRUNO HAMZAGIC
SOFTWARE USED:
MAYA AND ZBRUSH**

This month's Making of shows us the creation of this amazing image that gave Bruno Hamzagic the opportunity to mix two of his passions 3D artwork and football. Bruno makes good use of ZSperes to create the base for this month's fantastic making of and talks us through the whole process from the first sphere through to a great textured image.



01

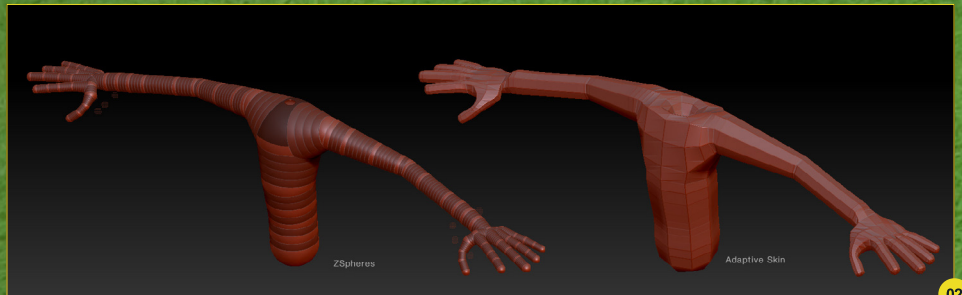
RONALDO FENOMENO

Software used: Maya and ZBrush

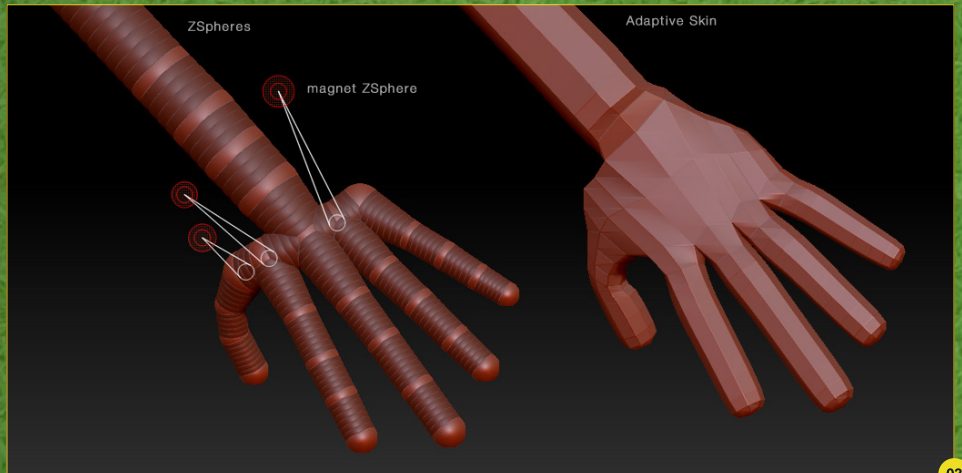
Since Ronaldo announced his retirement, I have been tempted to make a caricature of him. Brazilian people had plenty of great moments watching his performances in their national football team. Why not create this tribute to him? Sometimes a caricature can be closer to bullying than a tribute. I got into a lot of trouble in my childhood for using caricatures to play jokes on other kids. Flashbacks aside, humor can be a nice tribute and I think that this piece is no different. I tried to portray the awesome phase when he played in the 2002 World Cup, when he had his funny hair and big teeth.

CONCEPT

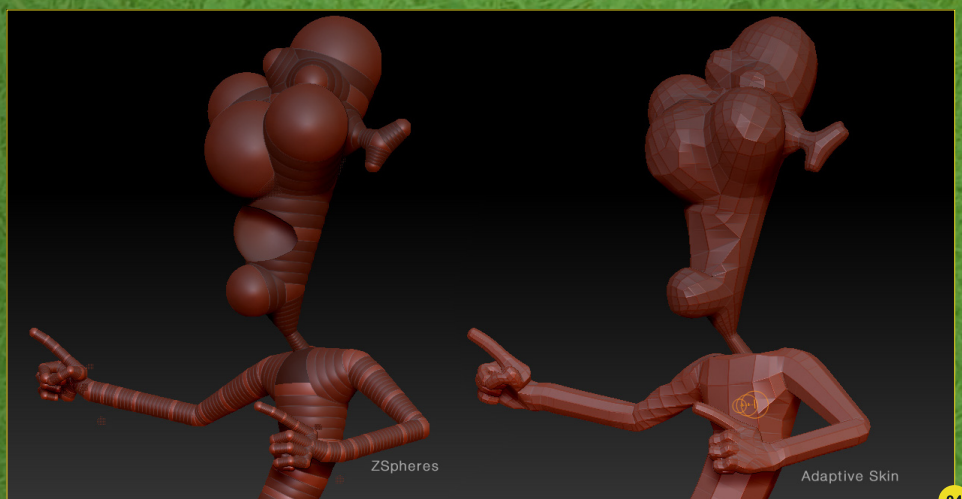
I began with some sketches to design the style of the caricature. I did several roughs trying to understand and reflect Ronaldo's character. Defining his appearance was a tricky step. He has a kind of crafty, joker look that is mixed with a spontaneous smile. I wanted to include his famous number 9 shirt, and show him pointing his finger like he did when celebrating a goal. **Fig.01** was my favorite among my roughs so I used it as the concept.



02



03

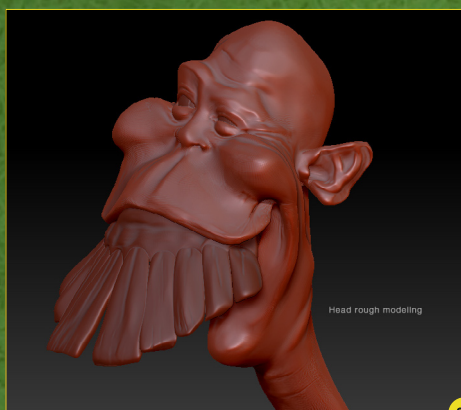


04

MODELING AND TEXTURING

In ZBrush I started the modeling process using ZSpheres, which made things look funny from the beginning. ZSpheres are a nice way to create an initial mesh to work with, especially when modeling body parts. Using X axis symmetry I quickly created the upper body (**Fig.02**). At this stage I tried to improve the adaptive skin by adding some magnets to the hand (Alt + click in a ZSphere in Draw mode) (**Fig.03**).

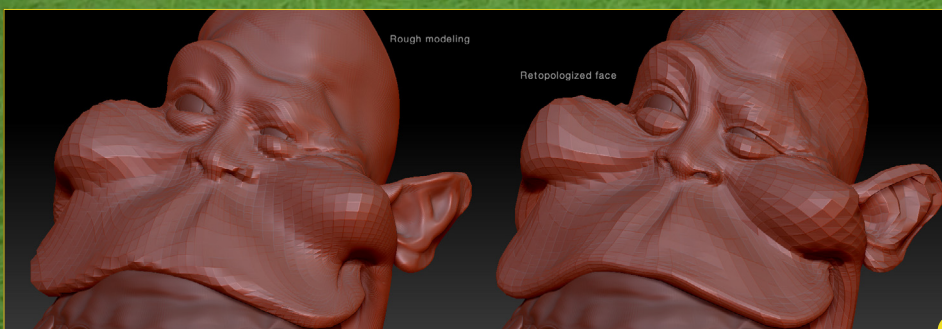
After I had done this the upper body was ready to be posed and sculpted. The head was a difficult step because of the face deformation. The upper lip needed to be huge to cover the teeth, which made the face modeling process a little different than usual. I couldn't create user friendly polygon topology at this initial stage so I just dealt with ZSpheres to get a nice polygon flow. For this reason my goal was to create an initial mesh with a good distribution of polygons based on the main volumes. The ZSpheres gave a really funny look to the armature and to the adaptive skin (**Fig.04**).



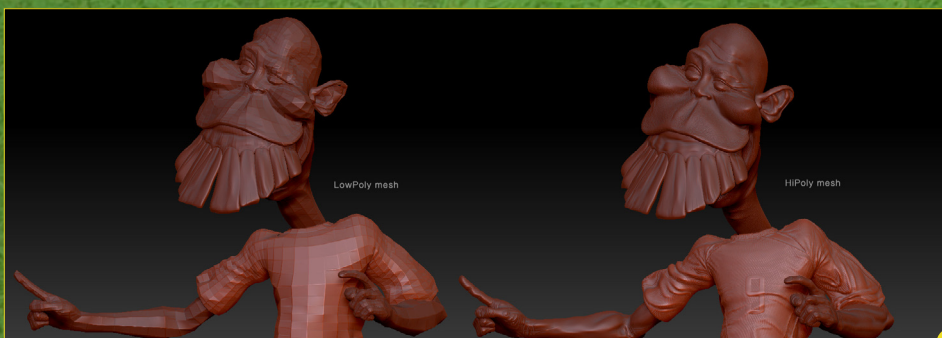
05

At this point I was happy that the head was ready and had good, workable polygon distribution, so I was ready to start the sculpting process. I created the face sculpture without thinking about the polygons. I just imagined the mesh was clay and had some fun. The process was very intuitive and fluid. The most time-consuming part of this illustration was the face modeling. After four days I had a model that I was satisfied with (Fig.05).

I was happy with the result as I thought the resemblance was good and I had a good laugh. The laughs ended though when I saw the boring task that was waiting for me. The polygon topology wasn't good. When I tried to increase the polycount to paint details like wrinkles, the polygons simply didn't have enough resolution where I needed it. So I had some fun with the modeling but was later punished because of the retopology... Ok, I deserved that! I spent about five hours crying and then a couple of hours sorting out the topology. It actually wasn't too



06



07



08

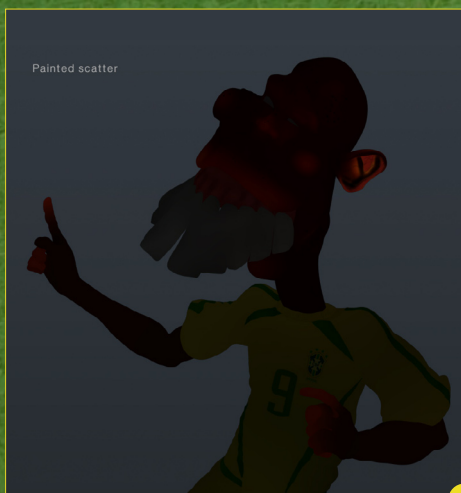
painful in the end. In fact it was very productive because with less polygons in the model it meant I could create a better mesh (Fig.06).

Finally with a good head and body mesh I could have some fun sculpting all the details. This step was really enjoyable! Two things are important at this point. Firstly, have a solid base mesh to work with. Secondly, be familiar with the workflow from ZBrush to Maya (as my intention was to render the caricature in Maya) (Fig.07).

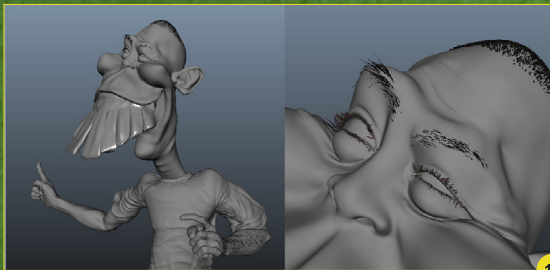
I used the UVMaster to unwrap the mesh. Something that saved me from another boring task was to paint all the textures on the model.

The hair, eyebrows and upper lip were three characteristics I gave special attention to as I think they are important parts of his appearance. The teeth exaggeration was very important too. I recognized at this point that maybe I was a little bad and took it too far. Maybe I will burn in hell... but come on! Those who don't laugh can cast the first stone! Just kidding... (Fig.08).

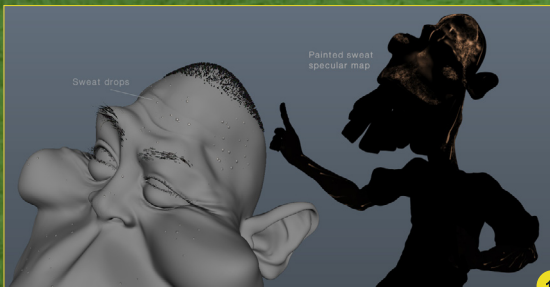
One map that I like to paint is the Scatter map. It was among several maps generated for the material setup. To export the maps and meshes I used the Multi Map Exporter Zplugin. All that was left to do then was to export the maps and meshes to Maya (Fig.09).



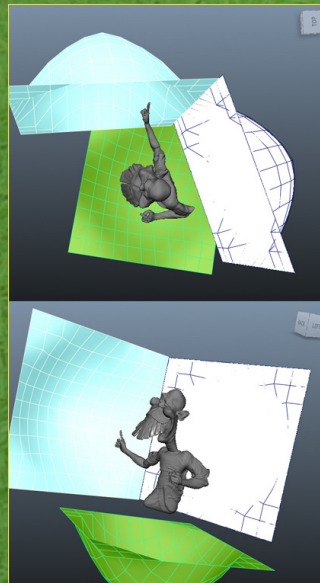
09



10



11



Soft rim light and ground bounce light with final gathering.



12

I used Shave to create the hair, eyebrows and arm hair. I combined this with the painted color texture to get a better result (Fig.10).

The last thing that I did was to add sweat drops and some specular highlights to the image. In my mind Ronaldo was celebrating a goal scored during a match, so I decided to add this little detail. Using the Paint Geometry tool in Maya, I added the sweat to the model. In ZBrush I painted a sweat Specular map and exported it back into Maya (Fig.11).

With all the materials ready, I moved on to illuminating the scene.

LIGHTING AND RENDERING

Even though I wasn't planning to put a crowd in the final image, the location that I had imagined

was a soccer stadium, where there are many light sources. I worked with a main and a secondary light to reproduce this. Besides that, I used several spot lights to highlight some of the detail, like the eye specular and the shirt material.

One approach that I used was to use auxiliary geometry light sources with Final Gather to obtain a soft rim light and ground light bounce. I put two surfaces behind and one below the model, filled them with a bright incandescence color and disabled Primary Visibility. Turning on Final Gather meant that these surfaces behave like light sources, creating nice soft lights (Fig.12).

To render the scene I used mental ray in Maya, and separated some render passes. The hair and fur I rendered in a totally separated pass

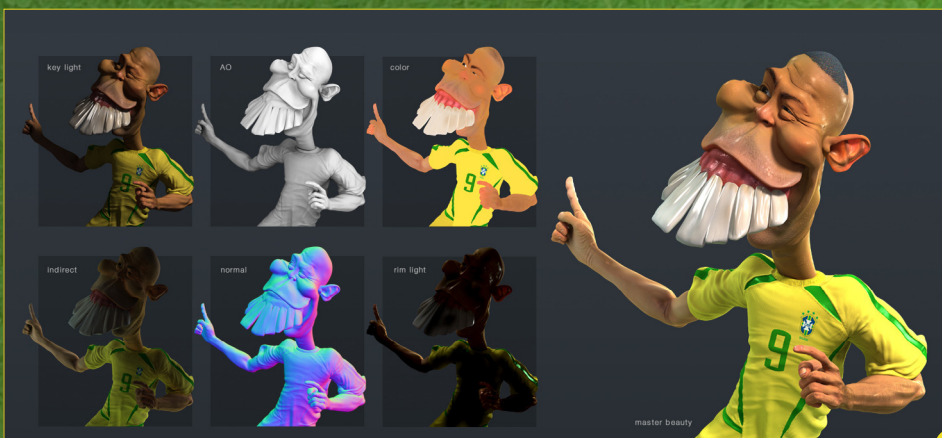
because it increased the render time so much. I like to render a normal pass to use in Photoshop to help when making corrections later. In this image I used it to improve the rim light in the final appearance and to highlight some unwanted dark areas (Fig.13).

I composed the final image in Photoshop, making some color adjustments and adding some post effects like glows and depth of field. For the background I choose to use a Bokeh effect representing a crowd full of flashing cameras.

CONCLUSION

This illustration was a very enjoyable and instructive experience. The final result could do with a lot of improvements. Every time I look at it I see something that could be better, but I am also very proud of it. Most of the people that look at this caricature have the reaction that I hoped for. There are also people who feel disgusted. This is nice too though, because I think that this work is disgusting. I think my tribute was to use disgusting work to show that I am a big fan of Ronaldo.

Thank you very much for taking the time to read this article! I hope you enjoyed it.



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BRUNO HAMZAGIC

For more from this artist visit:

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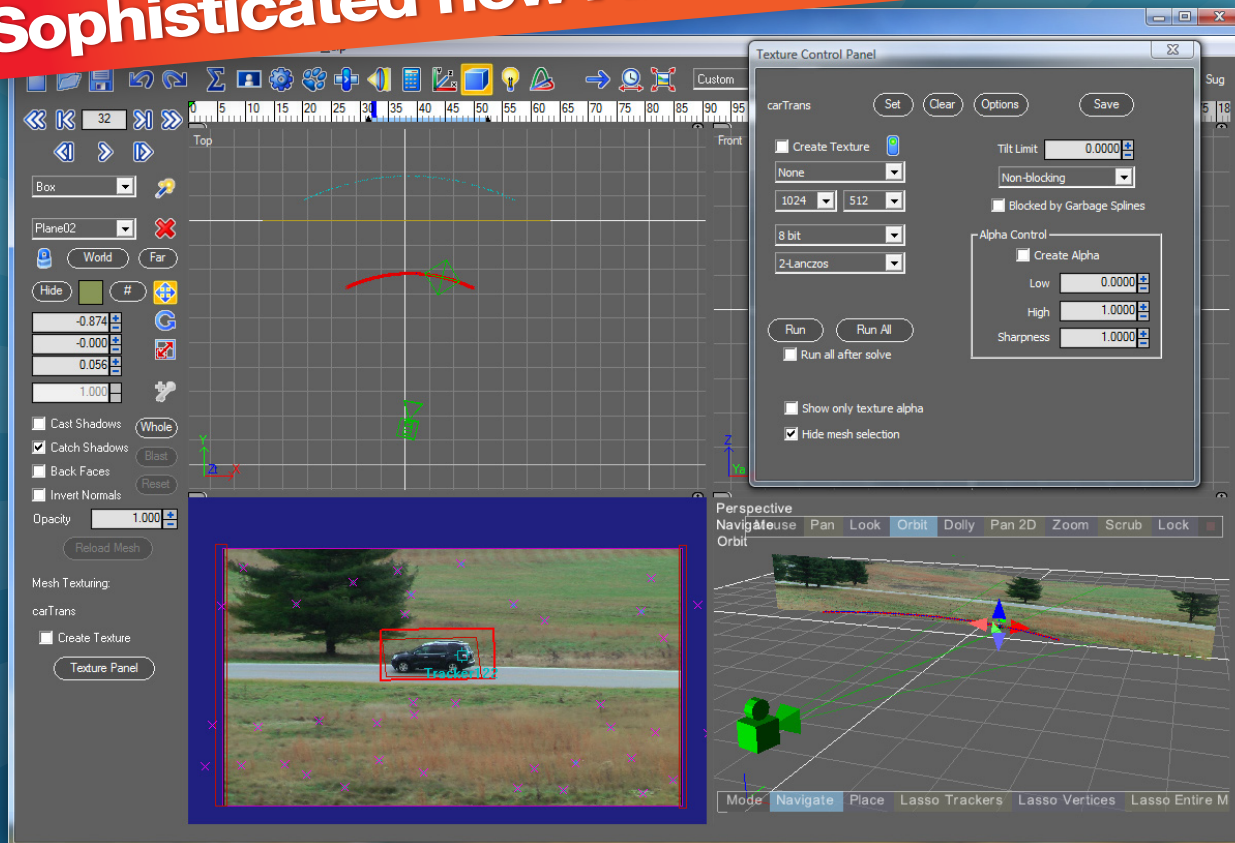




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This month we feature:

"FRANKENSTEIN'S MONSTER"

BY ANTO JURICIC TONI





FRANKENSTEIN'S MONSTER

BY ANTO JURICIC TONI

JOB TITLE: Character / Environment Designer - Primate
SOFTWARE USED: Maya, ZBrush, Silo

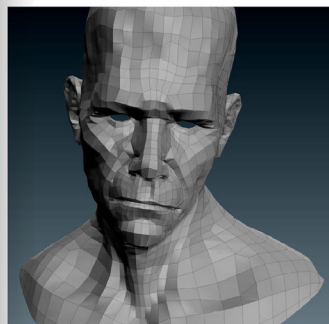
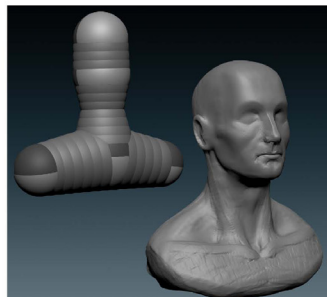


INTRODUCTION

The saying, "A picture is worth a thousand words" was my primary guideline on this project and I hope this image can say a few words. It was a big challenge for me at the time to overcome the technical challenges because this was one of my first Maya projects, but even more challenging than that was creating something that would "touch" the spectator.

I have always wanted to model Frankenstein's monster because he's a classic character with such a strong story and so this was a great opportunity. Many great artists have created versions of this subject and produced

WITH EACH AND EVERY PERSONAL PROJECT I TRY TO LEARN SOMETHING NEW RATHER THAN JUST USE THE SAME WORKFLOW OVER AGAIN



great work which made my job that much more difficult. I thought that best way to reach to spectator was through facial expression, through his eyes, which would tell the story of a sad, lonely monster.

With that in mind, I planned out how to go about achieving my goal. The first job was to split the work into different tasks such as: sculpting a base mesh, retopology, making a high definition sculpt with new clean topology, making clothes, posing, unwrapping, texturing, hair, lighting, rendering and finally composing.

MODELING

With each and every personal project I try to learn something new rather than just use the same workflow over again. This time I decided to take a more artistic approach and use digital sculpting as much as possible. The quickest way for me was to make a simple ZSphere bust in ZBrush (Fig.01) and make a generic bust sculpt with a few features that would reflect my final model, such as a long head and the facial expression.

My next step was to retopologize my base mesh because clean topology and evenly distributed polygons always

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pay off later in the process. For this task I used ZBrush9 + retopology tools and Silo for editing the new topology. With this new mesh complete it was time to create the proportions and the Move brush was a perfect choice for the task. After nearly an hour of tweaking and exploring different forms in ZBrush, I finally arrived at the following (Fig.02).

Now came the fun part that I enjoy most - sculpting.

I have learned over time that the overall form of the model is more important than details such as skin pores and fine wrinkles. These are the kind of details that will come at the end so the best advice I can give about sculpting is not to rush to the detail work. It is easy to get carried away with all those brushes and the possibilities that ZBrush or other sculpting software can offer. Keep yourself contained and don't divide your model too soon into higher poly counts. After you have used every possible polygon to describe form, step up the level and continue the process.



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After a few hours of having fun in ZBrush and exploring different poses and expressions, I was happy with the results and I re-used some clothing from earlier projects to complete the full scene (Fig.03).

TEXTURING

Before creating any color information the model needs to have a clean UV map. The right choice for this task was some great software called UV Layout which enables you to unwrap the model in a matter of minutes. Since ZBrush was my main tool for this piece I decided to continue to use it for the texturing too. I decided to make the monster look kind of fleshy and more alive-looking rather than the pale version seen in many illustrations and the movie.

To achieve this kind of look I planned to use mental ray for rendering as it's a great fast skin shader. Fast skin shaders come with many slots for textures that need to be added in order to achieve real looking skin, but I decided to use only the main ones such as overall color, front and back scatter, specular and bump. In my opinion the best way to make human skin is to use actual photos because skin color is really complex and composed of many different shades of red, yellow, blue, white and many other shades which are hard to recreate by hand.

I found the easiest way was to project photos directly onto the mesh using Zapp link and combine a few different projections in Photoshop. I then edited the original textures further to make a few more from left to right - front, overall and subsurface color (Fig.04).

If you desaturate the base texture and apply the High Pass filter then you can generate a great bump map.

HAIR

I have tried a few different solutions for hair, but the one that works best for me is the shave and haircut plug-in for Maya. If you are working in 3ds Max then this plug-in is already implemented as the hair and fur system. Basically the workflow was simple: I made scalp geometry which I then populated with hairs, the modeling of which was really fun, using the many brushes integrated in this tool.

CHARACTERS

Rendering the hair was a bit difficult and after much trial and error I decided to render it with the Maya software renderer. This is quite fast at rendering hairs and blending them together with Ambient Occlusion, which I also rendered in mental ray (Fig.05).

LIGHTING & RENDERING

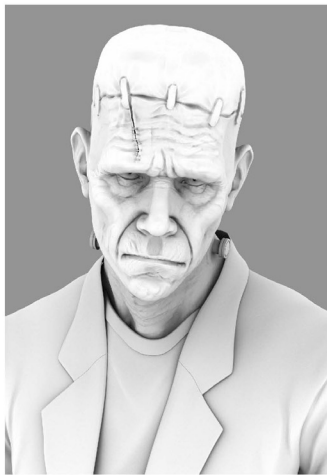
Lighting a portrait is very important. Good lighting can add much to a scene and bad lighting can ruin it. Basically I imagine lighting as painting the image with light so that every light in the scene has some color and purpose. I was guided by the three point lighting theory even though I may have eventually used more than three lights. Most of the lights in this scene were Area lights because they produce very accurate shadows and a softer feel. Also Area lights react with the specular components of fast skin materials, so the bigger the light the wider the specular reflection which can give you great control over the final look of your skin. Since I did not use any Global Illumination I added a few more lights with only diffuse aspects in order to emulate some ambient light.

After rendering the beauty pass I rendered out an Ambient Occlusion pass (Fig.06) and composited everything together in Photoshop.

CONCLUSION

This project was a great experience for me and I learned that exploring new ways of producing art and different workflows can pay off and be very rewarding.

Making art and having fun at the same time is fuel that keeps me going and I hope you have enjoyed reading this article as much as I did writing it.



ARTIST PORTFOLIO



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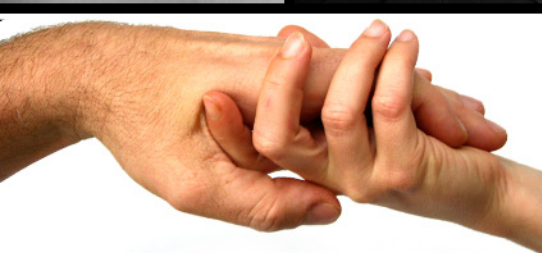
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MODELING FEATURES OF THE HUMAN ANATOMY



Modeling the features of characters is something that has caused problems for many artists over the years. A good model can easily be spoiled by an incorrectly modeled feature, such as a hand or an ear. This eBook offers a step-by-step guide to help you make sure you never struggle with feature modeling again, presenting detailed chapters that have been written specifically for 3ds Max, Maya, Cinema 4D and modo.

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CHAPTER 4 - HANDS

Software used: 3ds Max

INTRODUCTION

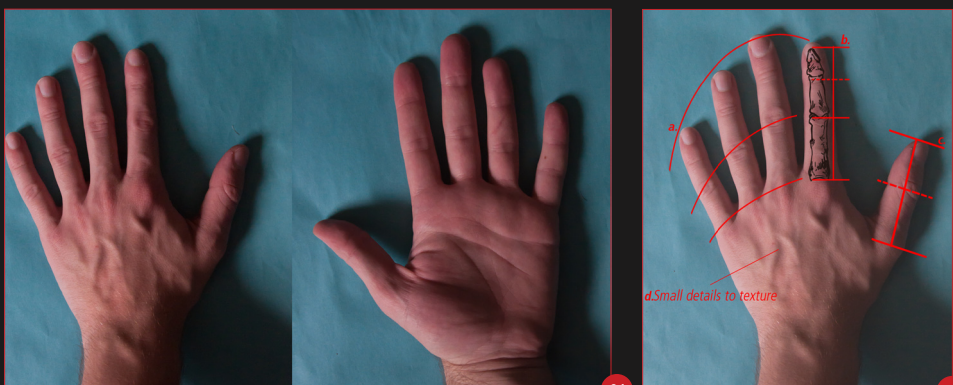
We should take care when modeling hands because it is very easy to make mistakes. The repetition of the fingers and poor quality references can be confusing. As you can see from **Fig.01** it is best to have good references as I do and at least two of them, one of the top of the hand and one from the palm side.

I would recommend that you always take into consideration that athletic men usually have short, thick fingers and women have long, thin fingers. It's a rule you can apply to make your hands look credible, but as you know rules can be broken. In fact my hands break this rule. My fingers are large and thin but that's because I have a basketball player's hands! Ask your friends to show you their hands, it's a good exercise to compare the diverse types of hand, but don't forget to tell them it's for an anatomical study!

CONSTRUCTION

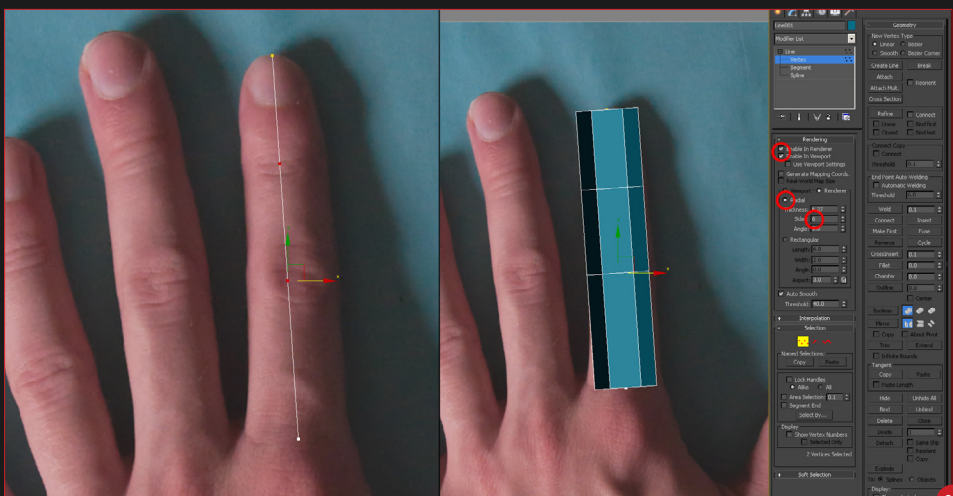
Keep in mind the arc that is created when the fingers are open. This will give you a much clearer idea of the proportion and distance there should be between the phalanxes of each finger (**Fig.02a**).

Another important point is the size of the phalanges. The second and third phalanx of the fingers is the same length as the first joint. When the fingers are bent at the first joint they are bent in half. If your hand is going to be animated the riggers will appreciate you taking things like this into account (**Fig.02b**).



01

02



03

The thumb only has two phalanges (**Fig.02c**).

Small details such as veins and wrinkles on the palm can be solved perfectly by texture (**Fig.02d**).

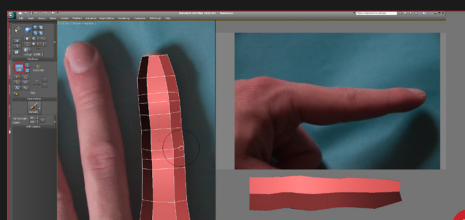
MODELING

Put your image in the front viewport to model it. As always I start by using Splines to create the fingers as cylinders. I add a strategic vertex in each section line and also add active renderable parameters so you can see the Spline as a cylinder. An important thing to change is the default number of sides to the cylinder, changing 12 to 6. I work with a basic mesh to make it easier to model quickly then later you can add a subdivision level and collapse the model (**Fig.03**).

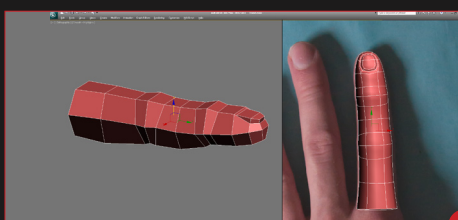
The next step is to convert the model into an editable polygon and begin to make a more defined first version of our index finger. This finger is then copied to the other fingers. Add a few loops in the area of articulation, one to define the nail and one at the center of each phalanx. With the Freeform Shift tool you can now change the shape easily, both in top view and side view (**Fig.04**).

Tip: Learn to use the keyboard shortcuts to change the brush size and strength, and to shift the parameters. Left mouse button + Ctrl = Falloff. Shift + left mouse button = Strength.

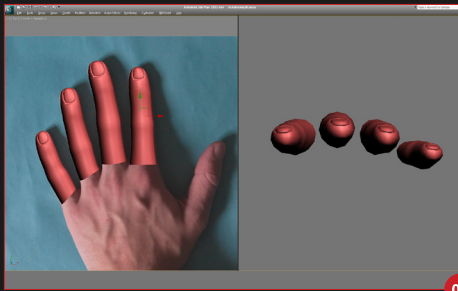
Continue to add detail to better define the shape, making sure you use your references. Insert the nail. Remember that the finger will subdivide further later and this will change and smooth the shape of the fingers so at the moment we are just trying to create the shape of the finger using the reference (**Fig.05**).



04



05



The next step is to clone the finger and adjust each one of them to match the reference. Also create the arc of the hand that I mentioned earlier (**Fig.06**).

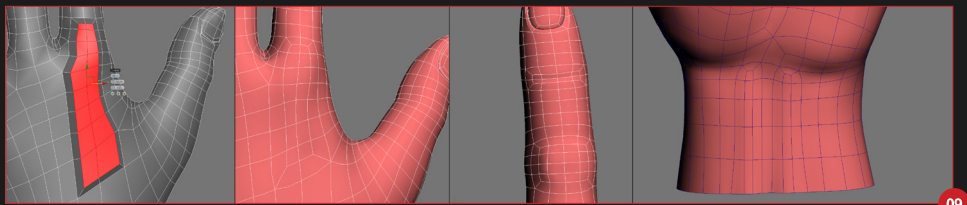
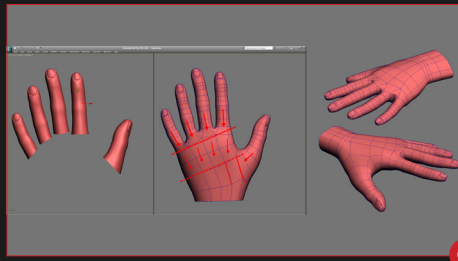
You can use the same technique to add the thumb. You will need to change the mesh a lot because the shape of the thumb is so different to the other fingers, mainly because there are only two phalanges but also because it is shorter and fatter. The next stage is to add a box for the hand area. As you can see in the wireframe in **Fig.07** I've tried to maintain a regular flow between the finger mesh and the hand mesh. Keeping the flow of the mesh helps to keep things clean.

Continue to adjust the hand, remembering to look at it from as many different angles as you can. Use your hand as the reference when modeling any viewpoint not in your reference.

DETAIL

By now you should have created the first version of your basic hand, just without much detail. By having less geometry we've worked quickly and kept close to our reference without any problems. The next step is to go a little further and add the detail that makes our model more interesting.

Now we can add more detail and collapse the model. We will use the Freeform tools because having more geometry means we can break and define the contour more easily. Notice how I have improved the shape of the nails in general, especially on the thumb (**Fig.08**). I've also improved the palm bulges. Now they look much smoother and better built. To do this I've used



the Freeform tools again (I admit it, I love them – especially tools like Push/Pull or Relax/Soften).

Tip: Memorize the keyboard shortcuts to change the brush size and strength. After improving the general form add more detail such as the tendons from the Palmaris Longus muscle and refine the knuckles. To do that I've selected the area I want to extrude and bevel, then adjusted them manually. I've also used a cut to create a wrinkle. They are not really necessary because we can put those in the texture, but it can help if the hand is going to be animated (**Fig.09**).

Finally, after an intensive modeling process, you should have something that you are happy

with. This can be the point where you clean your model, particularly on the fingers. I added some small details like the end of the Ulna bone in the wrist which can be visible from the surface. All of these little details will make your model look less flat and lifeless, and will make it look like more than just a piece of geometry (**Fig.10**).

I hope you liked my tutorial again! Thanks for reading!

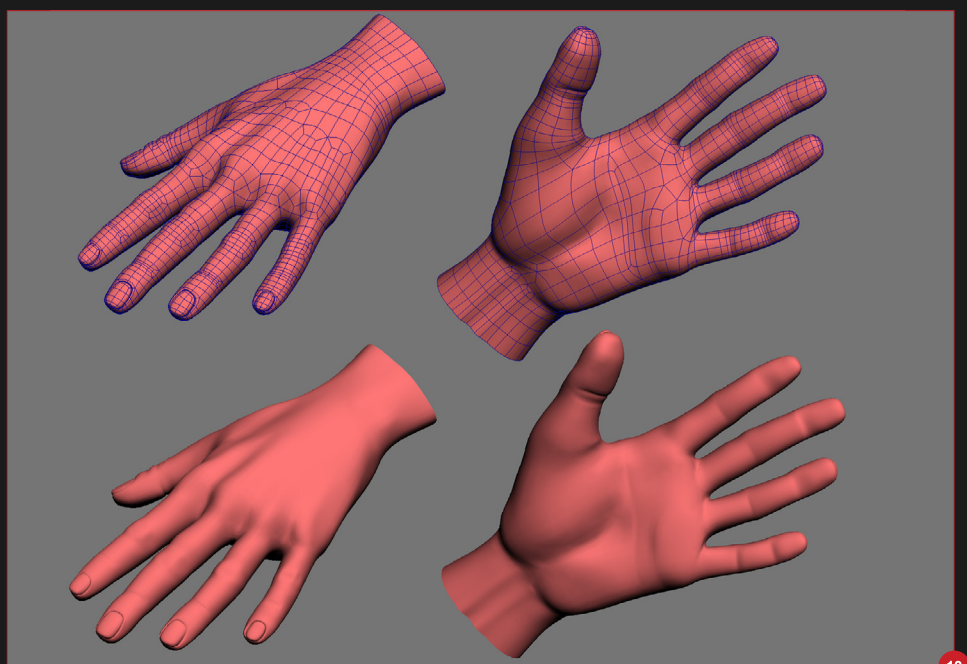
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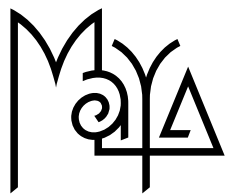
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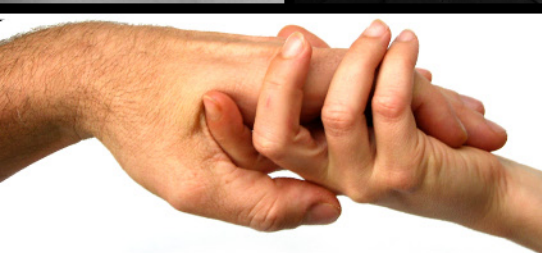
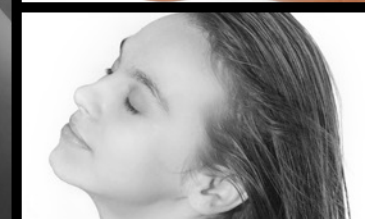
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MODELING FEATURES OF THE HUMAN ANATOMY



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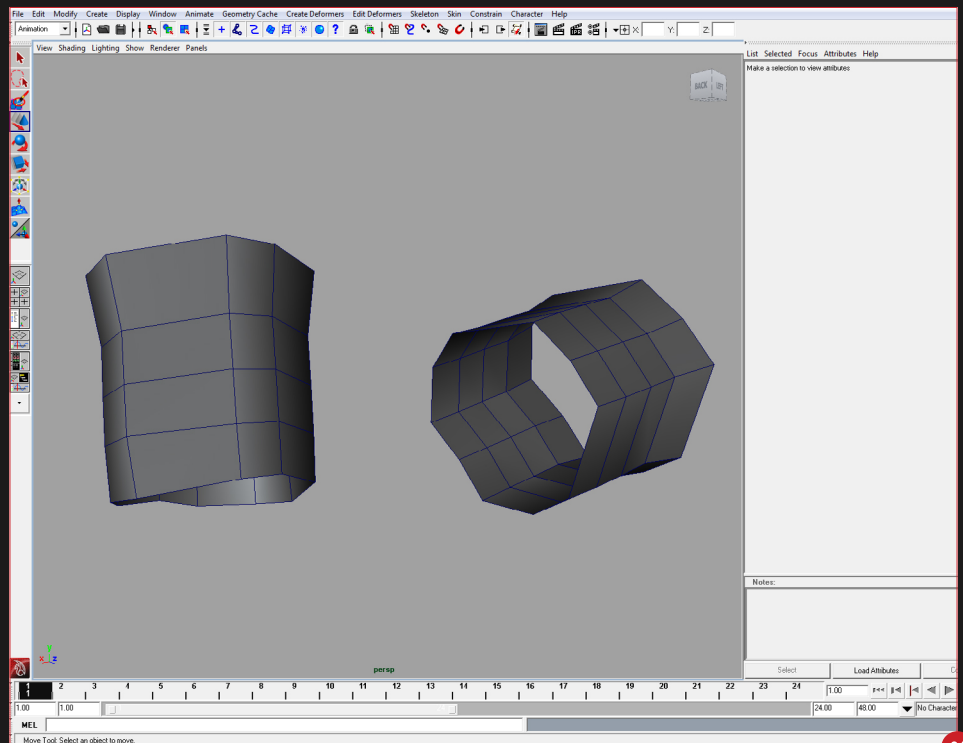
CHAPTER 4 - HANDS

Software used: Maya

Hands can tell you a lot about a character. For example, a barbarian might have a meaty paw or a mobster might be missing a finger. Such subtle details can really add to a story. In this tutorial I will show you my basic process for creating a human hand.

When it comes to hands, I treat them as if they are an entirely new object. Rather than working from a character's wrist to the fingertips, I begin by building a finger. The first step is simple: make a cylinder and delete the end (**Fig.01**). Add a few edge loops around the finger to retain mesh fidelity when it becomes subdivided. This initial piece can be as complex as you need it to be. Some artists are fine with a four-sided finger, where as I like to go a little heavier and have around eight edges.

From here I use the edge extrusion method to begin building the rest of the finger. Rather than modeling the finger straight, try to give it a slight curve. This will give the finger a more natural feel and help you visualize the bends (**Fig.02**). For the knuckles, I cut into the faces that will

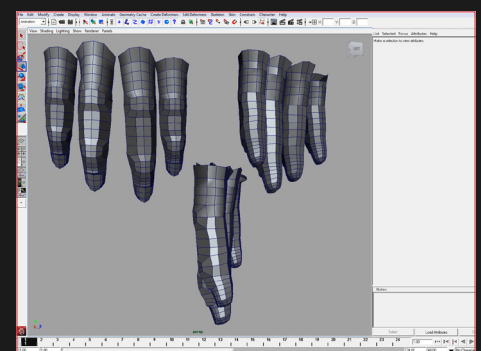
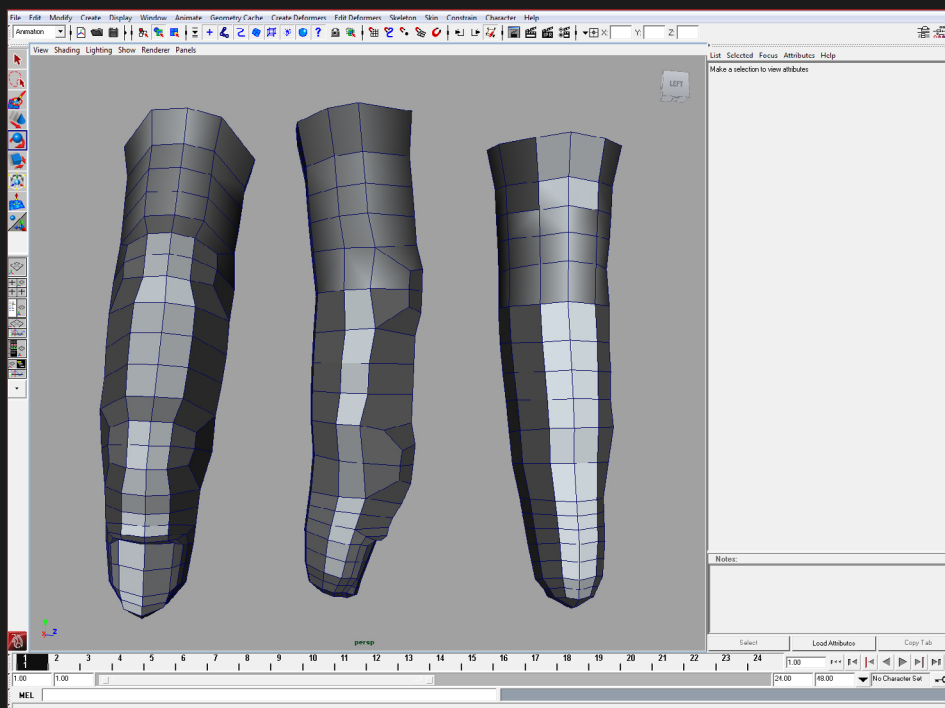


need a protrusion and push the center loop out just a touch. Changing the silhouette ever so slightly in this way helps get rid of the "sausage fingers" look.

I decide to put fingernails in my fingers by selecting faces near the tip of the finger and inseting them with a bevel. After this I grab the edges closest to the nail base and overlap

the nail geometry to create the mass near the cuticle. As a warning, adding this type of geometry on a base mesh for sculpting can lead to problems, as it requires more geometry in a concentrated area. If your intention is to sculpt a hand, it may be better to just leave the fingertips blank and sculpt in this detail.

Next I take the finger that I created and duplicate it three times. In general I keep the finger that I created as the middle or ring finger then adjust the different fingers' length (**Fig.03**). You'll notice that the fingers on a human hand are not the same length. In this example, I am creating the right hand, so the fingers will increase in length from the pinky to the middle finger with the index finger's tip lining up with the last knuckle on the middle finger.

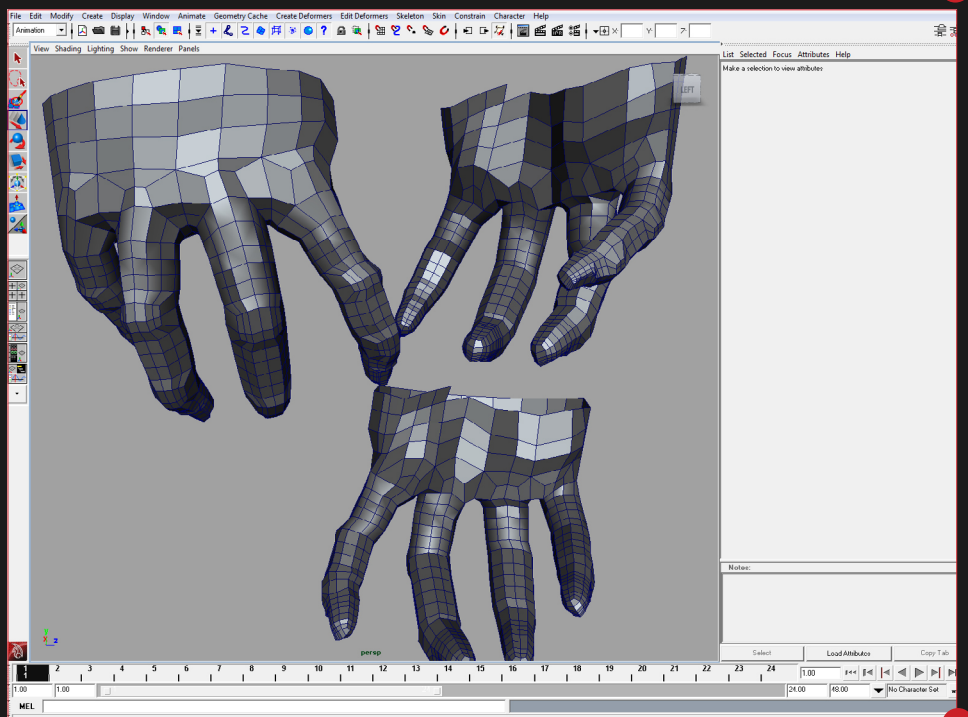
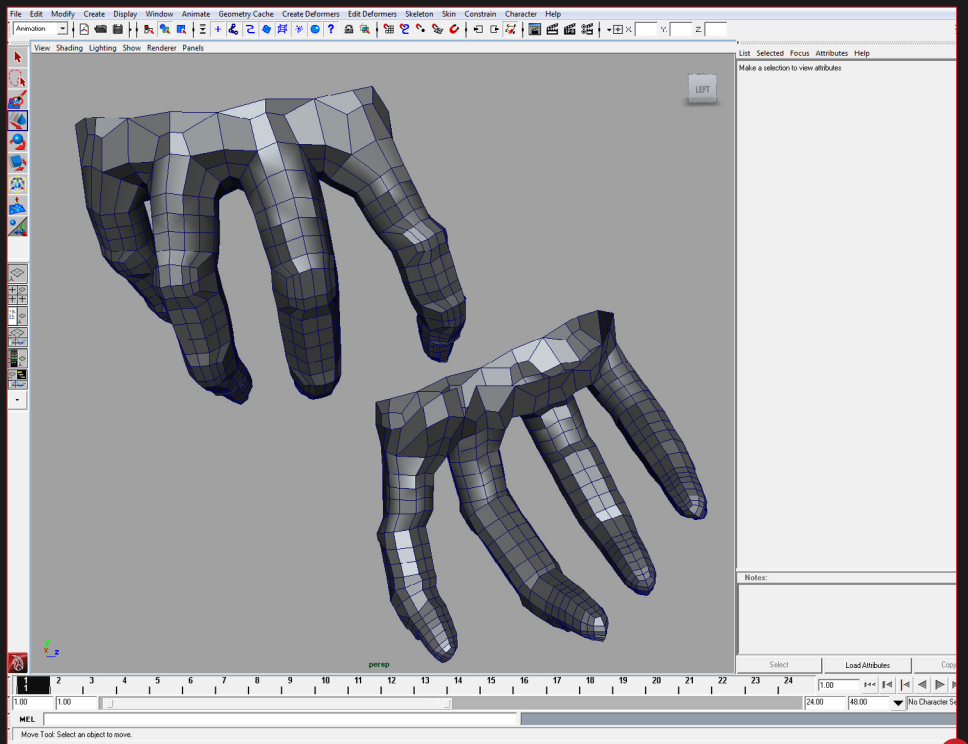
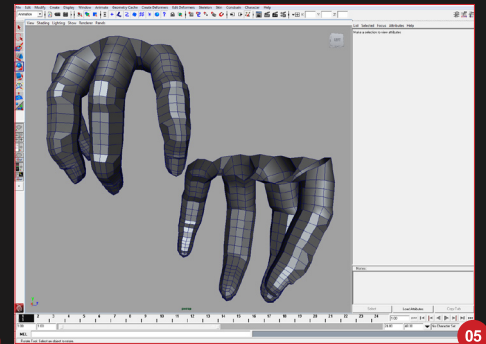
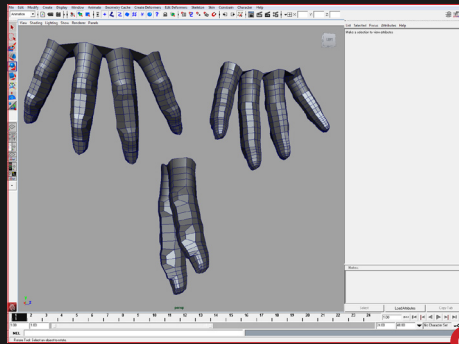


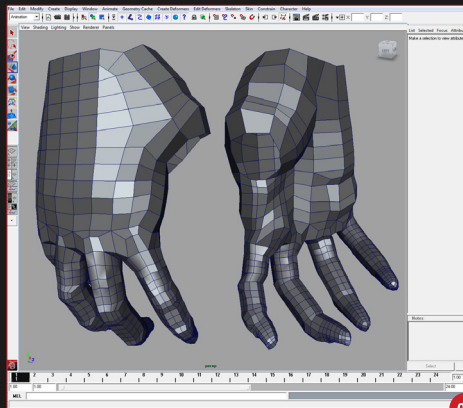
After this I fan out the fingers as if they are stretching apart by rotating each one. Much like the step above, I also stagger the fingers to offset the knuckle placement. You'll notice that when you make a fist, your knuckles are not perfectly in line. I connect the base of the fingers to create the thin webbing that would stretch in between the fingers near the knuckles (**Fig.04**).

To give the hand a little more life, I like to bend the fingers slightly at the knuckles, as if there is a little tension. This helps set landmarks on the fingers for sculpting and makes the fingers look less "boring". At this stage I also add in more loops for the webbing near the knuckles to retain the model's shape when it becomes subdivided (**Fig.05**).

Next, I will begin building the fingers into the hand by making the knuckles and connecting them together. I try not to go too overboard here, basically fanning out the border of the finger at the knuckle and joining it with the webbing geometry created earlier. This creates a loop around the finger at the knuckle which helps isolate each finger and defines the knuckle protrusion. If this hand were to be weighted in a game scenario, the palm is generally weighted to one bone with three bones for each finger. So, I tend to model with that in mind, leaving a defined edge that would be dominated by the hand bone with enough geometry between the hand and first knuckle on the finger to retain the shape when bending during animations (**Fig.06**).

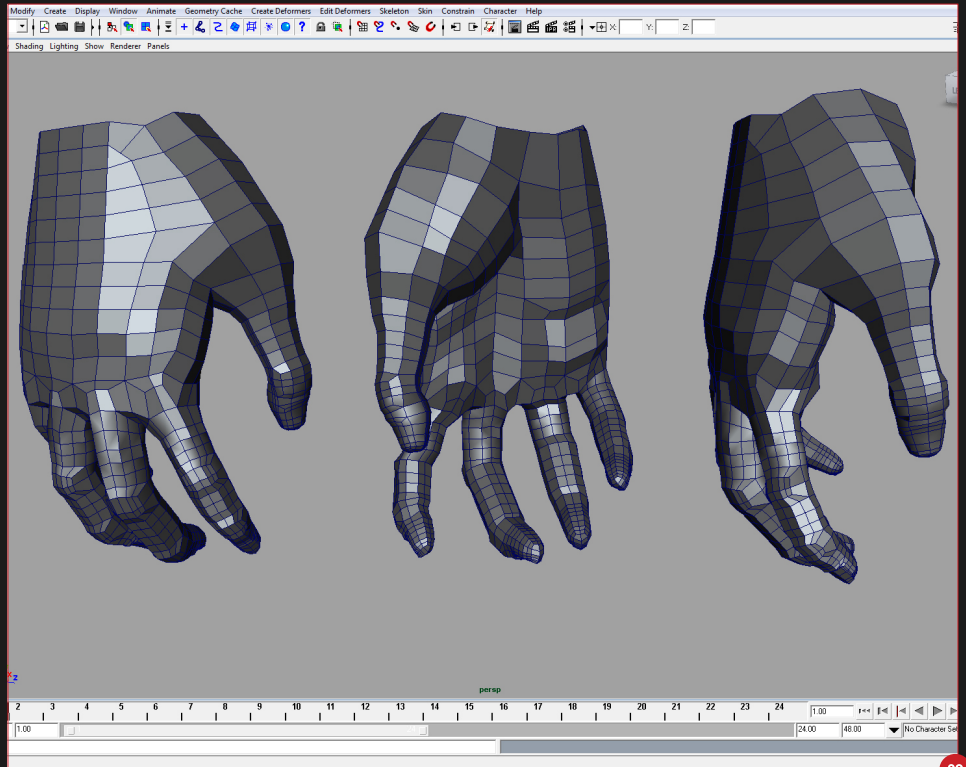
Using the edge extrusion method I begin to build out the palm and back of the hand. As with the fingers, you usually don't want perfectly flat and straight. I try to show the meat of the hands by forming pads on the outer edges with a dip in the center where it is mostly flesh on bone. For the back of the hand, you mostly want it to be rather flat (as in not defining veins, knuckles and the metacarpals) but to curve down toward the palm slightly on the inner and outer edges (**Fig.07**).





08

From here I continue extruding edges to build out the back of the hand to the wrist (**Fig.08**). On the palm I try to start the edge loops for the thumb as soon as I can. The thumb will affect a large part of the hand as it has a wide range of motion that requires it to collapse and compress on the palm and back of the hand. Defining the flesh that creates the base of the thumb reaching into the center of the palm can be greatly beneficial for this deformation. I also try to keep the same edge running down the center of the fingers, as if it were cutting the finger in half, into the thumb. This helps define the webbing and muscles between the index finger and thumb that will do most of the stretching and squashing as the hand spreads apart or makes a fist.



09

Next I create the thumb. I try to make the base of the thumb have the same number of edges as the fingers so that I can duplicate a fingertip, move it into place, and easily connect it to the rest of the hand. By duplicating the faces of a fingertip, I can modify it quickly to create the broader tip of the thumb, as well as the more bulky knuckle. From here I connect the thumb's

tip to the hand by bridging edges. I divide the thumb with a few edge loops, creating a taper from the hand to the knuckle (**Fig.09**).

Finally, we connect the hand to the rest of the arm. The key part to keep in mind is how the hand tapers into the wrist and how the heel of the palm drops down from the inner forearm. From here, I extrude edges out of the wrist and continue to the elbow area, usually defining the subtle twist and bulk of the muscles that the forearm would create. Of course, if I already had an arm created I would simply stitch the hand to the arm (**Fig.10**).

With these steps in mind, the same principles can be carried over to nearly any humanoid creature. Even the most grotesque monster usually has similar anatomy to that of a human, as it's something that we can all relate to and understand.

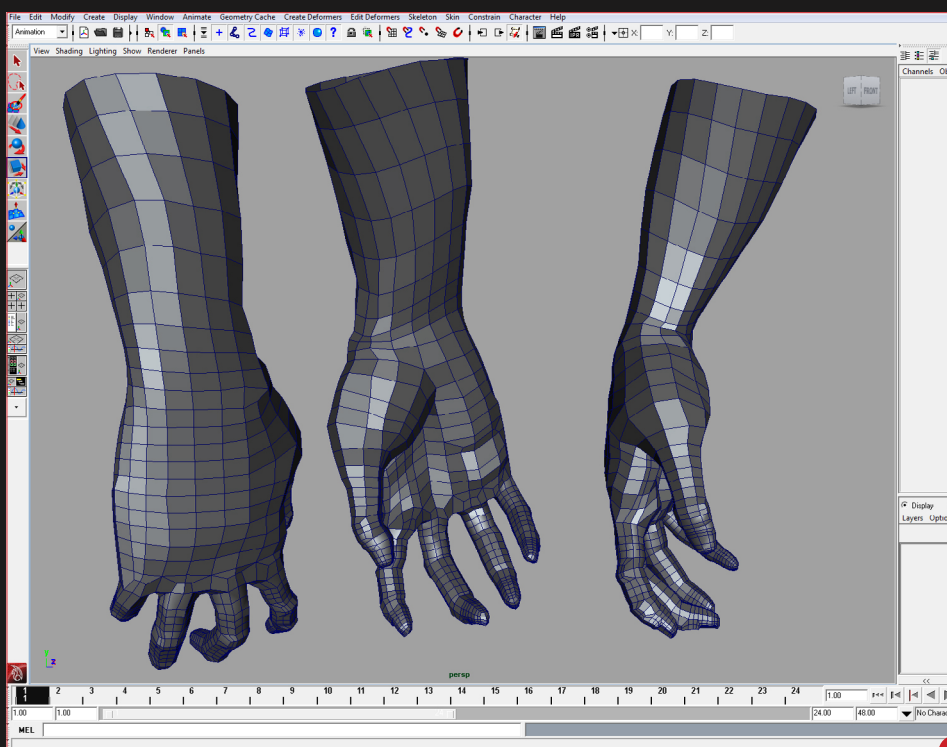
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Skin

CHAPTER 4 - HANDS

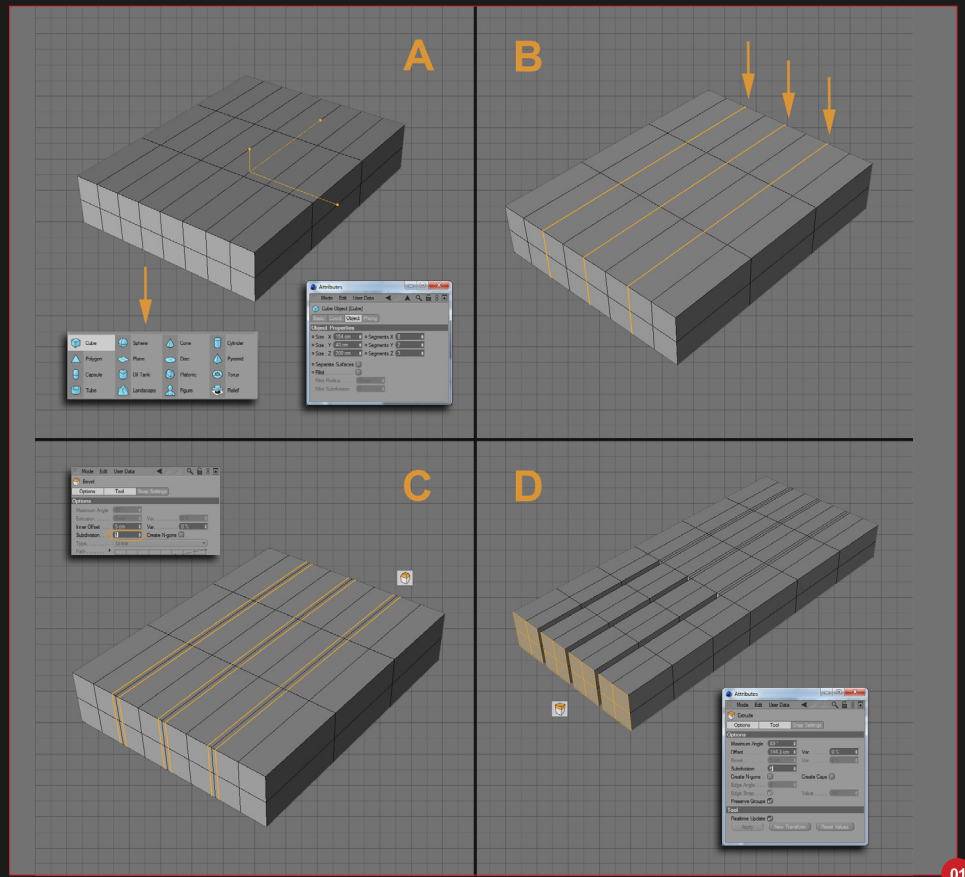
Software used: Cinema 4D

Create a cube and set the parameters to:

- Size X – 154
- Size Y – 40
- Size Z – 200
- Segments X – 8
- Segments Y – 2
- Segments Z – 3

Make it editable (**Fig.01a**). Select three alternate central loop edges (**Fig.01b**). With the Bevel Selection tool in subdivision mode split the edges previously selected (**Fig.01c**). Select the polygons corresponding to the fingers and extrude them with the Extrude Selection tool along the Z axis, which is set to 2 in the Attribute Subdivision panel (**Fig.01d**).

Before proceeding you should clean the mesh. Select Stitch or Sew and sew the points in the proximity of the fingers, back and palm of the hand. Erase any excess edges with the Dissolve tool (**Fig.02a**). Select the first row of points adjacent to the insertion of the fingers and draw them closer to the fingers. Create a new cut with the Knife tool in Loop Mode by dividing the polygons at the center of the hand (**Fig.02b**).

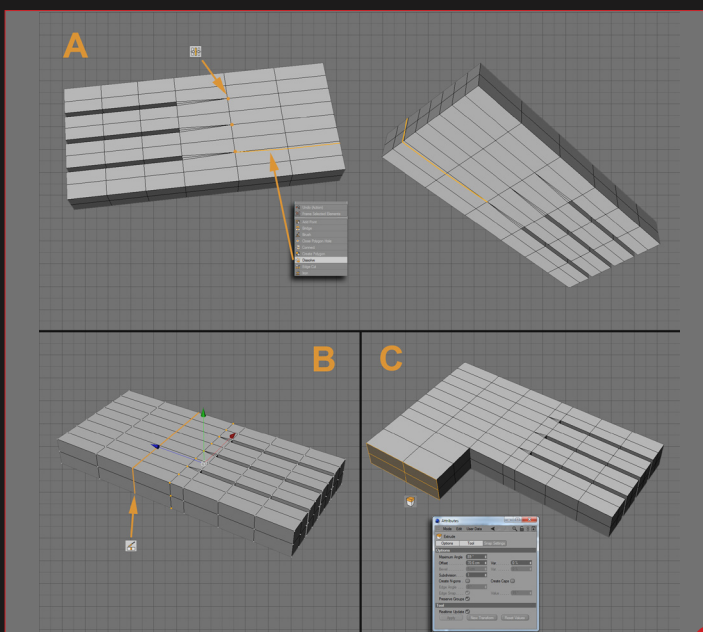


01

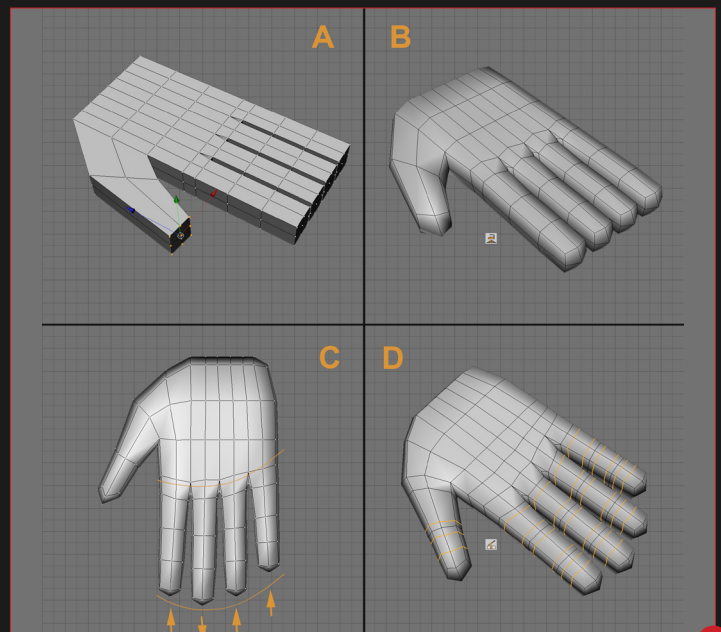
Select the polygons at the base of the thumb and extrude them with the Extrude Selected tool along the X axis. Set the Attributes to 1 in the Subdivision panel (**Fig.02c**).

Select the new points created by the extrusion and move them into the shape of a thumb (**Fig.03a**). Select the Mesh tool and slightly

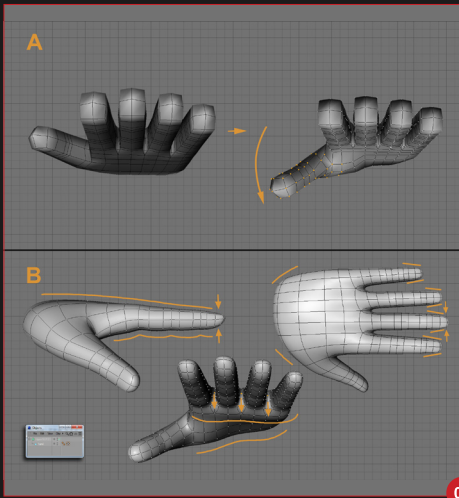
relax the mesh by moving the mouse while holding down the left mouse button (**Fig.03b**). Switch to the Top View and move the finger's points, giving them proper curvature (**Fig.03c**). Select the Knife tool in Loop Mode and create new cuts, one at the root of the nail and one at each end of the phalanges (**Fig.03d**).



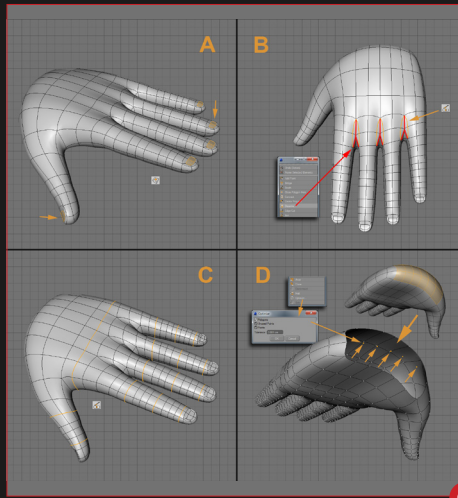
02



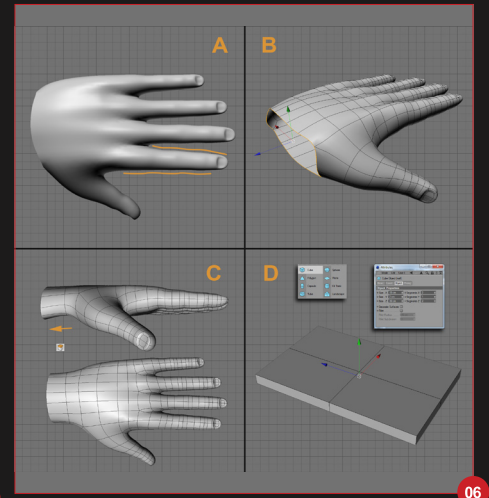
03



Select the points that made up the thumb and rotate them along the Y axis. Move the pivot to get the correct rotation and give it a more natural position. Remember to select the points at the metacarpal bone (**Fig.04a**). Before taking the next steps transform the hand to a HyperNURBS object and give the hand some volume (**Fig.04b**).



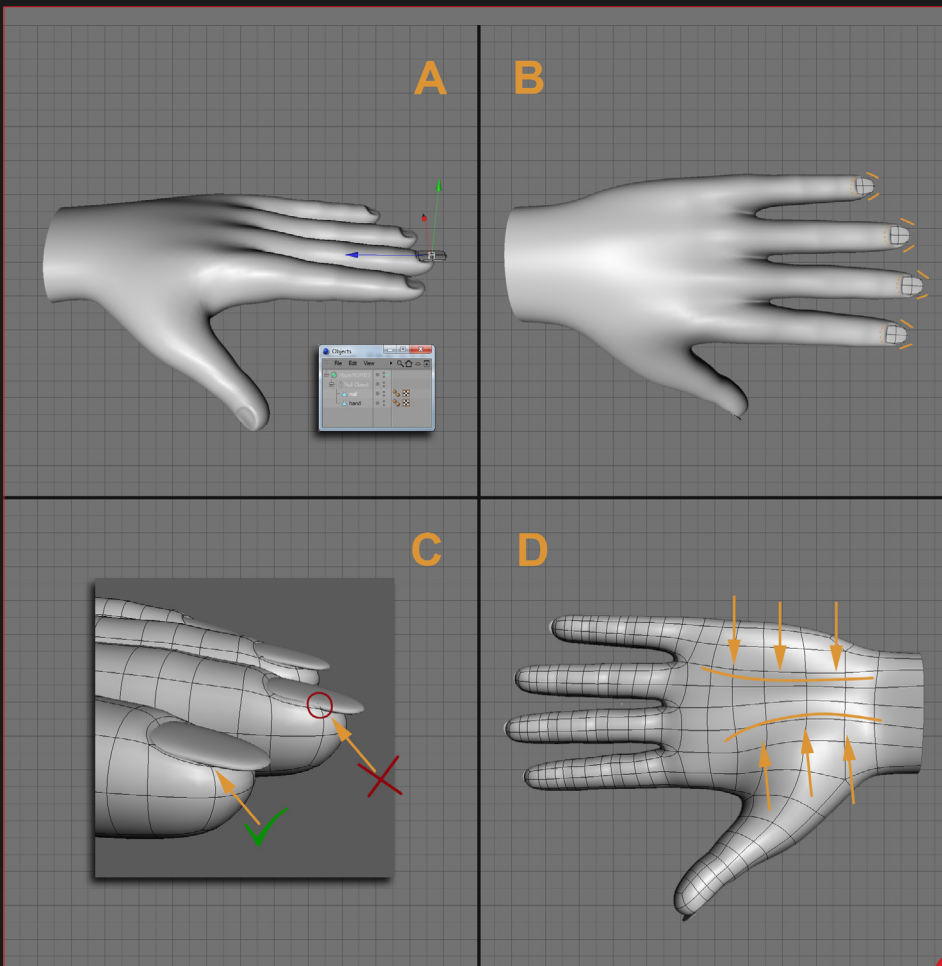
Select the polygons at the nails and extrude them inwards with the Extrude Inner Selection tool. Push the new polygons inwards creating space for the nails you are going to create (**Fig.05a**). Create new cuts at the joints of the fingers using the Knife tool in Line mode. You can remove the excess edges in Dissolve mode. This will serve to highlight the metacarpal bones (**Fig.05b**). Select the Knife tool in Loop



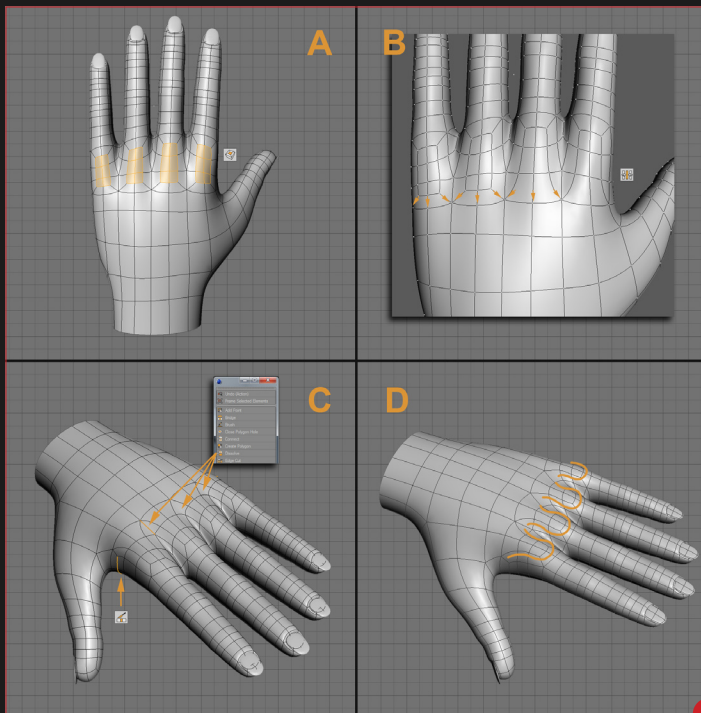
mode and make new cuts in the middle of each phalanx (**Fig.05c**). Select the polygons at the wrist and delete them. Remember to remove the points in excess, using the Optimize tool with a Tolerance of 0.001 (**Fig.05d**).

Before proceeding make sure the hand is anatomically correct and make your fingers more slender (**Fig.06a**). Select the edges corresponding to the wrist (**Fig.06b**) and extrude them with the Extrude tool. Give the wrist an anatomically correct shape (**Fig.06c**). Now create the fingernails. Create a cube with the following parameters and then make it editable (**Fig.06d**):

- Size X – 19
- Size Y – 2
- Size Z – 30
- Segments X – 2
- Segments Y – 1
- Segments Z – 2



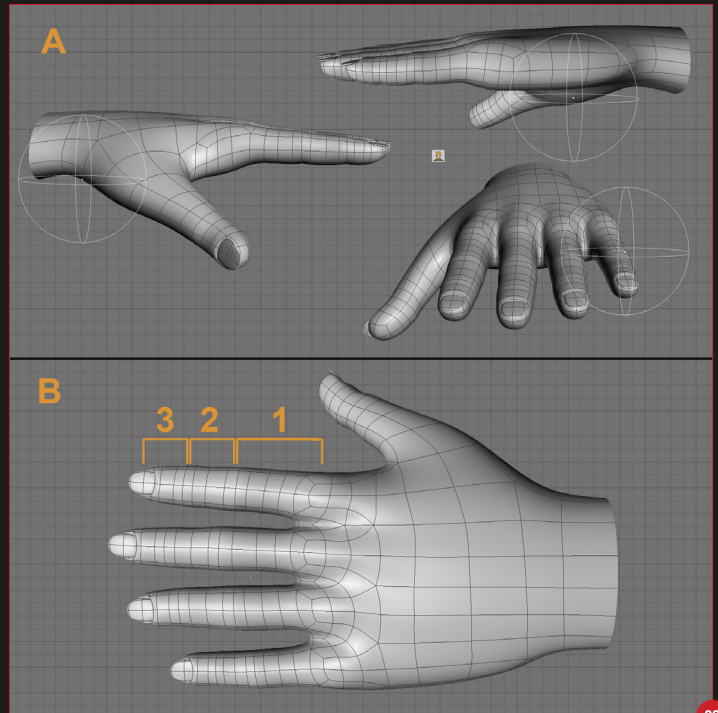
Select the new object and rename it "Nail". Create a new group where you join the hand and the nail, which is inserted into the HyperNURBS object (**Fig.07a**). Duplicate the nail object and place it at the end of the fingers (**Fig.07b**). Penetrate the root of the nail inside of the fingers, but be careful to avoid penetrations that are visible along the sides of the nails (**Fig.07c**). Switch to Bottom View and move the points of the palm of the hand, giving it a more natural shape (**Fig.07d**).



08

In this phase we will highlight the knuckles. This step is not essential, but it will be explained with the sole purpose of showing how you can add meshes to specific points of the model. Go back

to the Perspective view and select the polygons at the knuckles and extrude them inwards with the Extrude Inner Selection tool (**Fig.08a**). Select the Stitch or Sew Element tool and sew



09

the points near the back of the hand as shown in **Fig.08b**. Remove all excess edges with the Dissolve tool and add a new cut with the Knife tool in Loop mode, along the palm of the hand between the two triangles formed on the sides of the hand (**Fig.08c**). Move the points at the knuckles and give them an anatomically correct shape (**Fig.08d**).

At this stage you just need to give the hand its final shape. It will be much easier to do this using the Magnet tool. Take advantage of any references you have and move the points until you create the correct shape (**Fig.09a**). Keep in mind that the third and second phalanx you've added have the same average length of the first phalanx (**Fig.09b**). For greater detail and realism you can further subdivide the mesh or you could export the mesh into a sculpting program (**Fig.10**).



10

LINO MASCIULLI

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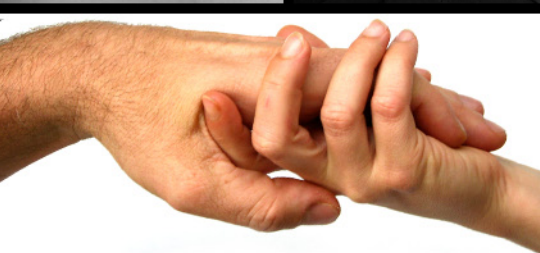
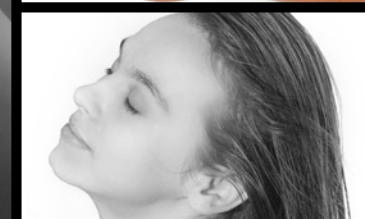
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MODELING FEATURES OF **THE HUMAN ANATOMY**



Modeling the features of characters is something that has caused problems for many artists over the years. A good model can easily be spoiled by an incorrectly modeled feature, such as a hand or an ear. This eBook offers a step-by-step guide to help you make sure you never struggle with feature modeling again, presenting detailed chapters that have been written specifically for 3ds Max, Maya, Cinema 4D and modo.

CHAPTER 1 | APRIL ISSUE 068
Ears

CHAPTER 2 | MAY ISSUE 069
Eyes

CHAPTER 3 | JUNE ISSUE 070
Hair

CHAPTER 4 | THIS ISSUE
Hands

CHAPTER 5 | NEXT ISSUE
Feet

CHAPTER 6 | SEPTEMBER ISSUE 073
Skin

CHAPTER 4 - HANDS

Software used: modo

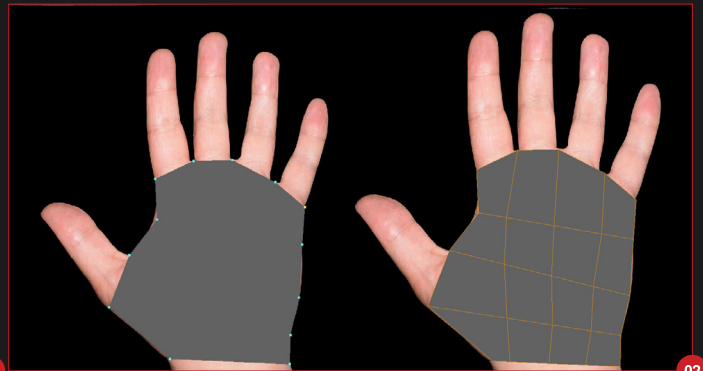
Representing a human hand in computer graphics is maybe one of the most complicated tasks for modelers, for a few different reasons. One of them is that the hand is composed of many joints and therefore can easily transform into a huge number of different shapes that can be a nightmare to pose or draw. Another important fact is that we use our hands in every day communication to express our emotions and feelings.

Through the ages of human history people have looked at people's faces and hands to judge their health, so any anatomical error rings an alarm that something is wrong. This means it is vital that you get the anatomy correct otherwise any errors will be obvious. The key element to making a CG hand look believable is setting up the correct proportions. Also understanding a hand's anatomy and mechanics is going to be of great importance in resolving this problem.

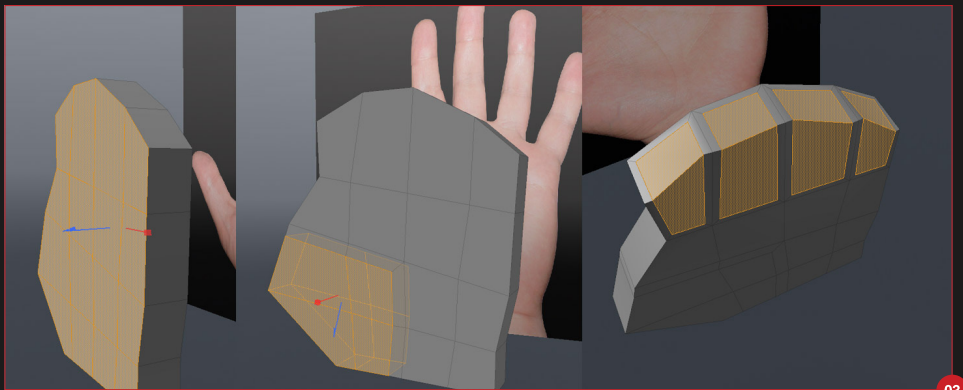
So let's say a few things about a hand's anatomy. Bones and tendons are the most visible component of a hand, especially if you are looking at the dorsum of the hand. On the palm side the pads of fat are the most prominent part. There are 27 bones in the hand. The wrist accounts for eight of those bones, which are arranged in two rows of four bones (**Fig.01**). The palm has five bones called metacarpals and each of them is aligned to an appropriate digit. Next to these are 14 phalanges, three for each finger and two for the thumb which misses the middle phalange.



01



02



03

The goal of this tutorial is to make the modeling process as painless and successful as possible. Therefore I made a simple plan that I am going to present you in next steps. First of all, to resolve the proportion issues, we are going to use a reference image which you can load by making a new backdrop item or simply dragging and dropping an image into the viewport. Once you load such an image you can choose the projection type under the item properties and for this task I am going to use Front Projection even if I am using the palm's side.

Once you have your reference loaded use a Pen tool to trace the shape of the palm as I did in **Fig.02**. Make sure you are making geometry on the new mesh item. Next use the Edge Slice tool to connect all the dots and turn it into quads.

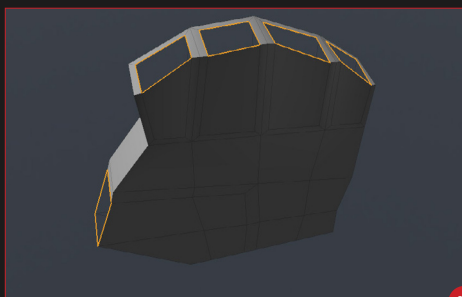
To prepare this plane for the next few steps we have to give it some thickness so use the Thicken tool to add some depth to the geometry, as illustrated in **Fig.03**. Select 10 polygons close to the thumb area and use the Bevel tool to insert loops that we are going to use later for the fat tissue on the palm area. Apply a similar process for the area where fingers are supposed to be connected, as illustrated in the third image of **Fig.03**.

Now you can delete the polygons where the fingers and thumb should be connected and move on to modeling a finger (**Fig.04**).

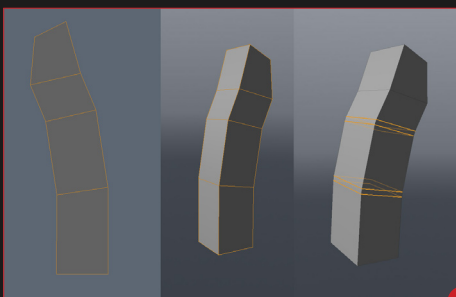
The plan is to model one finger and edit copies to make geometry for all the other fingers.

To make room for this task you can hide the geometry you have made so far as well as the reference image. You can hide any item by clicking on the eye icon in the item list.

Start modeling the fingers from a simple cube by extruding one side four times; three times for every joint and one for the nail area. To make it look more natural follow the shape illustrated in **Fig.05**. Add one more loop for each joint.



04

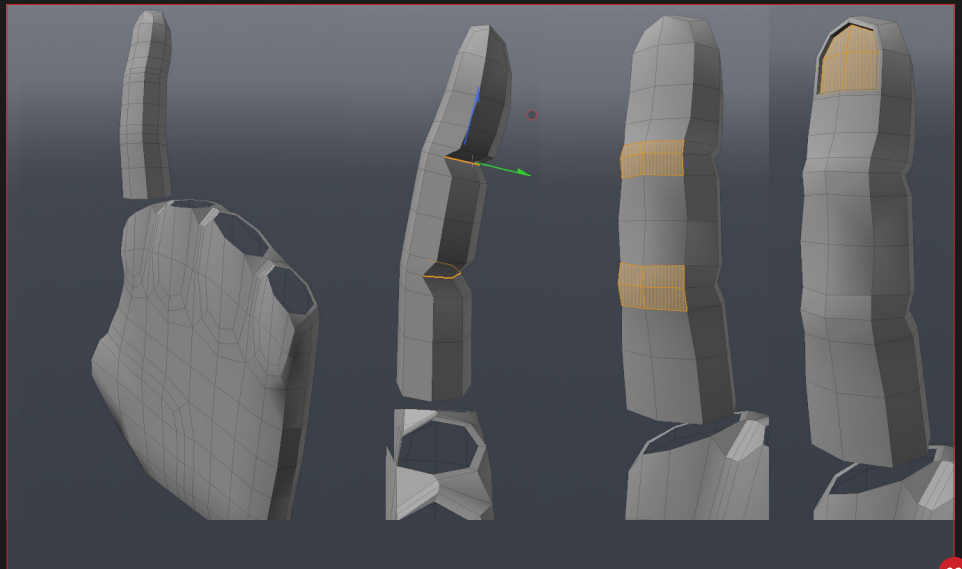


05

Now delete the bottom polygon to make a place for the connection with the rest of the hand. Also at this point you should start shaping the finger. The first step is to make it taper from the root to the tip either by using the Taper tool or by doing it manually.

Since we have the basic shape for the finger it's time to match it to the rest of the hand and place it near the hole we made earlier for the index finger. To continue shaping and adding more details we should add some more geometry, so select all the polygons on the finger and press "D" to subdivide once.

Repeat the same process for the hand part so they match up in the terms of edge loops and geometry. Now let's add some more detail to the finger before we copy it to all the other fingers. Select loops from the inner side of the joints and move them inwards in local space. Next select four polys for each knuckle and push them gently to emphasize that area. After that select four polygons for the nail area and extrude them once (**Fig.06**).



06

Now extract the nail geometry from the last selected polygon by simply coping polygons to the clipboard and pasting them to a new mesh item. After that thicken the newly created geometry by extruding the area, or by using the Thicken tool. Once you have the nail geometry cut and paste it back into the finger mesh, subdivide it to give it some resolution, and shape it with the Scale and Rotate tools to make it fit better and more naturally.

Here comes the fun part. Use the Move tool to reshape both the finger and hand area into a more natural looking shape. The modo sculpting tool is perfect for this task. After you finish the reshaping copy the index finger for the empty places and rescale them to match the reference image. Take the first two joints of the index finger and copy them for the thumb; since the thumb has one phalange less it's going to fit perfectly. Also note that the thumb is twisted more than other fingers so rotate it about 45 degrees. Don't forget that you can always use your own hand as reference (**Fig.07**).

After you have placed all the fingers, combine all the meshes into one. You can do it simply by cutting and pasting the mesh items. Before we take it further reshape the hand with modo sculpt tools, bridging open edges between the fingers and hand.

Although modo's sculpting tools work fine I know some people out there are emotionally attached to ZBrush's Move and Transpose tools. Fortunately modo works perfectly with ZBrush through the GoZ plugin.

However hard you try to make good-looking proportions your hand will always look strange until you attach it to the rest of the arm, or you can simply extrude the arm from the base of the hand.



07

After some reshaping with the modo Move brush and attaching the hand to the rest of the arm I was able to get a pretty decent result as you can see in **Fig.08**.

At this point you can go through some checks and reduce any unnecessary edges and clean up the geometry. I left this mesh as it is for the sake of the simplicity of this tutorial. I hope this series of steps will lead you to be able to make a successful model of a human hand (**Fig.09**).

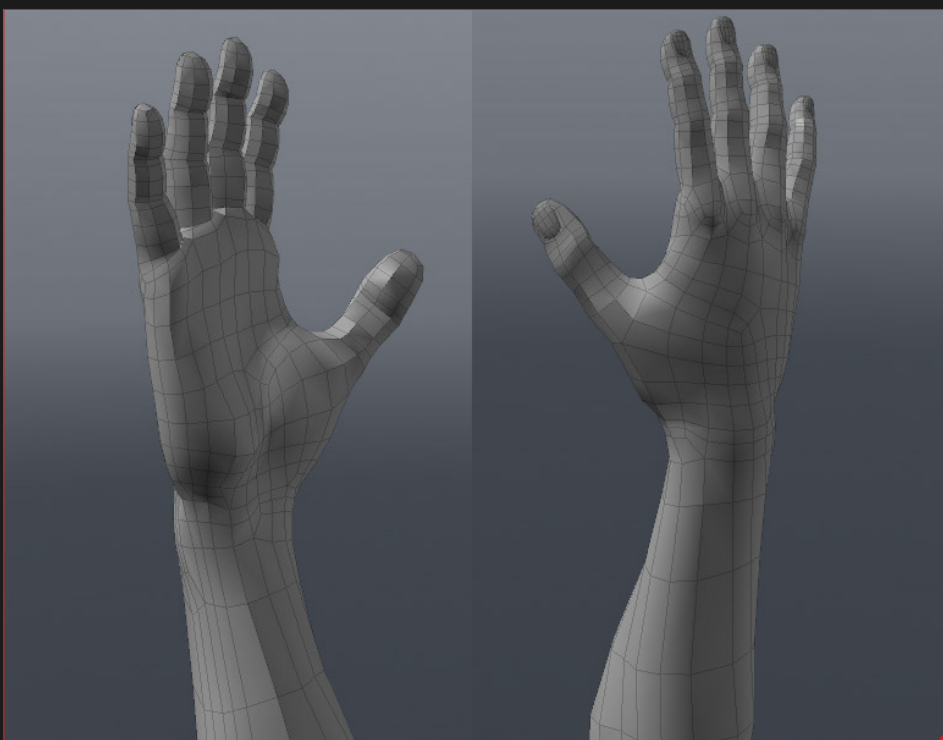
ANTO JURICIC

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